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**Recombinant Poetics:
Emergent Meaning as Examined and Explored
Within a Specific Generative Virtual Environment**

William Curtis Seaman

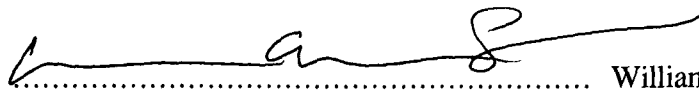
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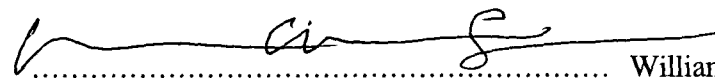
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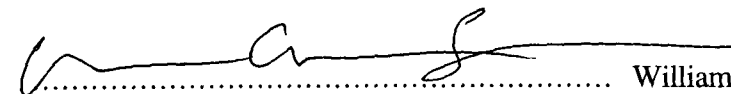
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Recombinant Poetics: Emergent Meaning as Examined and Explored Within a Specific Generative Virtual Environment

Abstract

This research derives from a survey of primary and secondary literature and my practice as a professional artist using electronic information delivery systems. The research has informed the creation of an interactive art work, authored so that emergent meaning can be examined and explored within a specific generative virtual environment by a variety of participants. It addresses a series of questions concerning relationships between the artist, the art work and the viewer/user. The mutable nature of this computer-based space raises many questions concerning meaning production, i.e., how might such a techno-poetic mechanism relate to past practices in the arts, and in particular how might its use affect our understanding of theories of meaning? If the outcome of this part of the research suggests a radical transformation in meaning production as dynamically encountered through interactivity with a generative work of art, then how might the construction of this device inform a new field of practice?

The scope of the topic and the secondary questions that flow from the initial speculation focus on the inter-conveyance of text (both spoken and written), image (both still and time-based) and music, as encountered by participants through interactive engagement within an authored and inter-authored virtual environment. The method has been to extend the realm of a series of theoretical positions relative to these areas as they appear in the mainstream literatures on art and interactivity, meaning and understanding. A virtual interactive art work has been developed in parallel to the literature survey and exhibited in Europe and Japan. The conclusions have been drawn by the author on the basis of a series of theoretical positions that examine the operative nature of an art work which is intended to generate emergent meaning. Future research is also discussed that seeks to extend our understanding and use of generative virtual environments.

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Preface

Recombinant Poetics:

Emergent Meaning as Examined and Explored

Within a Specific Generative Virtual Environment

We live in a time that is exemplified by fleeting messages, complex shifting meanings and mercurial contexts. Above all, the quixotic nature of computer-based environments, as well as media-contexts in general, shape our understandings of the world. As a people, we both potentially author these contexts and are a product of their forces. As we begin to address questions of meaning, we cannot fail to acknowledge the need to develop an interconnectedness between a series of transdisciplinary discourses surrounding meaning production. I have sought in this dissertation to answer the following question: Can an interactive art work be constructed so that emergent meaning can be examined and explored within a specific generative virtual environment by a variety of users? To answer this question from a contemporary poetic perspective suggests the need to draw upon knowledge from a wide range of disciplines.

I have researched approaches to emergent meaning, including literary, artistic, musical, technological, scientific and philosophical approaches. This includes relevant passages from semiotics and linguistics, as well as examining meaning production both in terms of pragmatics² and grammatology. I have also included specific scientific metaphors to articulate particular relations that have been deemed relevant to the study. In addition I have researched hybrid methodologies.

I have sought to address the nature of authored language-vehicles as they are employed and examined in a computer-based virtual space, through interaction. With the assistance of the programmer Gideon May, I have authored a generative virtual environment to experience aspects of emergent meaning. This environment functions as a specific techno-poetic mechanism. I have facilitated the investigation of particular forms of language use that are potentially generated within this authored and inter-authored virtual environment. I have provided a conceptual textual frame of varying approaches to meaning, to support the notion that generative technologically-based forms of conveyance can best be used as tools to reflect upon the complexity of this kind of new-media environment. The complexity that characterises my generative virtual environment is further framed by an elaborate, linked written narrative. Textual language alone has previously been shown to be inadequate in terms of approaching the

infinite complexities of lived experience, in particular articulating the demanding elucidation of virtual space. James Liu in his book *Language-Paradox-Poetics*, points out the "seeming contradiction" that is inherent to this statement.

The paradox of language may assume one of two basic forms, which may be considered two sides of the same coin. In the first form which may be called the obverse side of the coin, paradox arises from the seeming contradiction between the allegation made by many poets, critics, philosophers, Eastern and Western, in earnest or in feigned despair, that language is inadequate for the expression of ultimate reality, or deepest emotion, or sublime beauty... At any rate, if language is inadequate to express the reality about itself, then the allegation cannot be true. Even on the level of everyday discourse, when we say, "words fail me," we are expressing some kind of feeling and when we say of something, "It is indescribable" we are giving it a kind of description. (Liu, 1988, p.3)

Written and spoken text can, without a doubt, be used to articulate experience. What kinds of technology can we use to enhance and come to better posit this articulation? This is the driving problem behind the authoring of a specific techno-poetic mechanism — a generative virtual environment authored for the purpose of examining and exploring emergent meaning. The creation and use of technology enables the exploration of new media-territories. Shifting assemblages of media-elements are presented as an abstract media-landscape for interactive construction and navigation. Central to the generation of emergent meaning is a series of approaches to the authoring of evocative computer-based environments. Textual language is particularly inadequate in terms of defining experience as it is manifested within this quixotic space.

To some extent, it has become a cliché to describe the contemporary environment as being characterised by a deluge of media-messages exhibiting an excess of fleeting evocations. We are surrounded by a landscape exemplified by mixed-semiotic³ communications. We might say that the very nature of meaning has shifted in relation to new forms of mutable electronic media. The speed of exchange, the rapid pace of advertising and entertainment media, the advanced exploration of media in relation to architectural space, high-definition medical and scientific visualisation, the nature of connected and networked spaces of the World Wide Web, the employment of the hyper-link and virtual space — all suggest the need to revisit the contemporary use of language and its relation to other media-elements, to explore emergent meaning. We might need to adjust our existing definition of language to reflect the complexity and mutability of new computer-based media-environments. Language, as we know, is never static. It is always emergent, in that the context of its use is always in an ongoing state of change, as are the participants and technologies that define that use.

To best approach the nature of meaning as it is evoked within this elaborate computer-based environment, configurations of media-elements can potentially be explored through experiential means. The media-elements of text (both written and spoken), image (both still and time-based) and music/sound are exemplified in my techno-poetic mechanism by the following media variables: 3D computer graphic objects (non-textual), 3D spatial text objects, 2D texts, video digital image stills, digital video-image stills applied as texture maps⁴ (wrapped around graphic objects), short digital video loops, digital video loops applied as texture maps (wrapped around graphic objects), digital audio of various looped musical compositions, digital audio presented as spoken text and a set of glyphs representing various behaviours on the menu-system. When I use the term *media-elements*, I will be referring to a particular authored collection of modular variables, as categorised by these potential media types.

In particular, the techno-poetic mechanism highlights the evocative qualities of language as extended through the exploration of media. This is brought about through spatial and time-based interactive engagement with varying media-forms, as well as through juxtaposition with alternate media-elements and computer-based processes. I suggest that the incorporation of these media-elements should be seen as a conflation of different forms of articulation. All of these media-elements potentially contribute to the production of meaning, functioning as language-vehicles from the perspective of an expanded linguistics, or meaning-vehicles from the perspective of semiotics. A conflation of operative poetic language-vehicles is incorporated in this research to articulate chosen computer-based aspects of language use, to entertain emergent experience. This environment includes a collection of various media-elements, where text becomes one in a probabilistic set. There is no hierarchy to the choices that are facilitated by the *vuser* (viewer/user) ["Vuser" was coined by Seaman 2/5/98. It conflates the terms viewer and user. I will use this term throughout the dissertation] in terms of the generation of the virtual world. I have chosen the term *language-vehicle* to discuss media-elements within this dissertation in terms of their inter-conveyance.

I have focused on the notion that the techno-poetic mechanism enables the poetic construction of spatial configurations of differing signs. Morris states: "Something is a sign only because it is interpreted as a sign of something by some interpreter... Semiotics, then, is not concerned with the study of a particular kind of objects, but with ordinary object insofar (and only insofar) as they partake in Semiosis." (Morris, 1938) Peirce defines Semiosis:

By Semiosis I mean an action, an influence, which is, or involves, a co-operation of three subjects, such as a sign, its object and its interpretant, this tri-

relative influence not being in anyway resolvable into actions between pairs.
(Peirce, 1931, p.484)

I will often return to Peirce's definition of the sign, because it is sufficiently open and all of my media-elements can be considered as signs in terms of this definition:

A sign [or representation] stands *for* something *to* the idea which it produces, or modifies. Or, it is a vehicle conveying into the mind something from without. That for which it stands is called its object; that which it conveys, its meaning; and the idea to which it gives rise, its interpretant. (Peirce, 1931, p.171)

The techno-poetic mechanism that I have authored for this dissertation is a *conveyor* mechanism that enables the spatial configuration and reconfiguration of signs, as well as the interpenetration of signs. These signs can potentially function by "conveying into the mind something from without." Each individual media-element "stands *for* something *to* the idea which it produces, or modifies." I use the term recombinant sign to refer to the operative nature of signs within the techno-poetic mechanism. The mechanism enables one to explore Semiosis interactively. In particular, signs function to qualify or "modify" other signs in differing generated media-contexts. It must be noted that even with the simple clarity that Peirce uses in the statement above, there is much debate over what the term "interpretant" actually means (Moorjani, date not set).

To articulate textually the operative complexity of a mechanism that enfolds a transdisciplinary body of research is a problem I have sought to overcome in my dissertation. I present a working description of the *The World Generator / The Engine of Desire* ⁵, a generative virtual environment, to highlight the functionality of the device and its potential.

How does one go about discussing this form of complex mechanism, in that its very functionality is brought about through a condensation of transdisciplinary fields of research within one operative environment? Can we "unpack" the salient characteristics and processes enfolded in this device? This examination might be read as a string of non-sequiturs. The range of this research becomes problematic in that the topics, once unpacked, can appear to be unrelated. The foci are functionally enfolded within the rubric of the generative virtual environment. Each framed concept has its own merit in relation to the dissertation. I will ask that the reader be aware of this diversity and allow for periodic jumps from one research focus to another. I will endeavour to seamlessly bridge the topic areas, but in some cases this may prove impossible. Unfortunately, to remain clear I have made my dissertation longer than the expressed norm, in order to elucidate the complexity of the project. I have been expansive to be articulate, avoiding

a highly dense writing style. I believe the varying perspectives that I have provided here will lead to an enhanced understanding of this complex topic and thus are relevant to this focused exploration.

It must be noted that an elaborate and logical process was followed to arrive at this techno-poetic mechanism. Intuitions are also central to artistic, philosophical and scientific practices. I have identified the need to construct a device to explore mutable environmental relations between media-elements in virtual space. This particular kind of meaning-space is characterised by potential unfixity. I have coined the term *cyber-polysemic space* to refer to this media-conglomerate technological setting, one that explores the notion of a new multi-dimensional linguistic environment as exemplified within a performative virtual space populated with mutable assemblages of media-elements. This environment intentionally conflates mixed-semiotic *milieus* as a new form of operative, computer-based inscription.

Among the flows that make up this complex assemblage of perspectives, in every instance I will seek to define a particular relevance back to the central issue, that of examining and exploring emergent meaning production within a specific techno-poetic environment.

The techno-poetic mechanism enables the vuser to construct individualised virtual worlds in real time, from a series of media-elements and processes that are housed within the computer-based environment on virtual container-wheels. A physical interface table is directly connected to the virtual space. By manipulating a space ball, a track ball and two toggle buttons, the vuser is empowered to navigate, explore, construct, alter, and abstract media-elements within the space. Interactivity with the authored system enables them to assemble and navigate complex, dream-like worlds. A slow, floating, water-like physics is authored into the environment. The vuser can explore dynamic juxtapositions of media-elements in a palpable and interactive manner, always comparing the initial media-elements as found housed in the container-wheels, with their recontextualisation presented on a virtual plateau. It is through these dynamic juxtapositions that emergent meaning arises; the media-elements have been specifically authored to heighten this possibility. Each participant engages her/his choices, contributing to the continuous visual and sonic variety exhibited by the space. Behaviours that are attached to these media-elements contribute to the kinetics of the environment. The space functionally diagrams certain of the processes that have contributed to its construction. The techno-poetic mechanism exhibits non-closure. Each new participant generates an alternate virtual world and thus contributes to emergent meaning production in an active manner. [Please see the enclosed CD-ROM

for an elaborate visualisation of the techno-poetic mechanism throughout the reading of this paper.]

1 The term "recombinant poetics" was created by the author in 1995. It was introduced to Roy Ascott as a potential area of investigation at CAiiA during ISEA (September 1995) and registered within the application title in December, 1995. Work delineating the concept was first published on the World Wide Web in April, 1996 on the CAiiA web site: <<http://caiiamind.nsad.gwent.ac.uk>>. Subsequent research has shown a related metaphorical use of the word "recombinant" by Mitchell in his discussion of "recombinant architecture" (Mitchell 1995, p.47). Other artists and researchers have used the term "recombinant" in a metaphorical manner, including Arthur Kroker (Kroker, 1994) and Diana Gromala. Gromala is currently working on a book called *Recombinant Devices: Ideologies of Virtual Design*. Doug Kahn, in *Wireless Imagination* (Kahn & Whitehead, 1994, p.13) also suggests poetic relations to DNA in the work of William Burroughs and Brion Gysin. Sergei Eisenstein, in *Film Form*, (Eisenstein, 1949, p.67), speaks of the "genetics" of montage methods. The Critical Art ensemble have also written about the "recombinant sign." (Critical Art Ensemble, 1994) The exploration of modular, recombinational systems can be witnessed in my art work as early as 1981.

2 Deleuze and Guattari suggest that "Pragmatics can be represented by four circular components that bud and form rhizomes: 1) The generative component: the study of concrete and mixed semiotics; their mixtures and variations. 2) The transformational component: the study of pure semiotics. 3) the diagrammatic component: the study of abstract machines, from the standpoint of semiotically unformed matters in relation to physically unformed matters. 4) The mechanic component: the study of the assemblages that effectuate abstract machines, simultaneously semiotizing matters of expression and physicalizing matters of content." (Deleuze and Guattari, 1987, p.146) I will elaborate on the above relations, in different contexts, throughout the course of this work.

3 I will often use the term "mixed-semiotic." (Deleuze and Guattari, 1987, p.147) It suggests that there are more than one *milieus* of semiotic information that have been intermingled, combining different operational planes, i.e., text, image and music/sound each form a differing *milieu*. Media-elements may also simultaneously function in multiple *milieus*.

4 Texture maps look like a projection onto the surface of an object, wrapping around the object entirely.

5 See the enclosed CD-ROM documentation of *The World Generator/The Engine of Desire*.

Introduction

New technological potentials have been delineated through the authorship of a computer-based virtual environment, in order to best embody and make operative a diverse set of approaches to the production of emergent meaning. This divergent body of research has been used to inform the authoring of a specific computer-based generative virtual environment. In so doing, I have posited an expanded notion of poetics, as articulated through technological means. Through the course of this research, a series of diverse approaches to emergent meaning have been defined. These approaches inform the construction of a computer-based, generative virtual environment — one that enables the exploration of varying media-element inter-relations. This authored generative virtual environment is referred to as the *techno-poetic mechanism*.

A plethora of perspectives are relevant to the project. In order to best approach this task, issues surrounding a contemporary technological definition of poetics have been articulated. The nature of the sign, as it pertains to emergent meaning in a computer-based context, is inherently complex. Different approaches have been drawn upon to elucidate the nature of the employment of various signs within this environment. The mutable nature of my technological environment presents a series of problems that often can not be fully answered through historical approaches to meaning production. In each case I have sought to find the most relevant historical approach and then propose a means of extending or re-seeing that approach in relation to this new form of technological context. In the book entitled *Structure, Context, Complexity, Organisation* the authors discuss one definition of context:

Textual information describes individual or local features and is clearly necessary in order to recognise something as different from something else. In order to identify a context, it is necessary that such individual and local features have some degree of permanence. A context is thus characterised by permanent or semi-permanent textual information. Complexity of a system, on the other hand, is related to its internal structure, i.e., to correlations. (Eriksson, Lindgren and Mansson, 1987, p.2)

It is obvious that within virtual worlds we are dealing with a very new visionary form of conveyance, where contexts are constructed through various spatial "correlations" of media-elements. This conflates the notion of "context" with the concept of "complex systems" and simultaneously potentially removes "any degree of permanence."

Derrida, in *Of Grammatology* (Derrida, 1976), in the chapter entitled "The End of Book and the Beginning of Writing," expresses a series of ideas about the expansion of "language" into a very new form of "writing."

By a hardly perceptible necessity, it seems as though the concept of writing — no longer indicating a particular, derivative, auxiliary from of language in general (whether understood as communication, relation, expression, signification, constitution of meaning or thought, etc.), no longer designating the exterior surface, the insubstantial double of a major signifier, the *signifier of a signifier*, — is beginning to go beyond the extension of language. In all senses of the word, writing thus *comprehends* language...

Derrida continues...

The secondarity that it seemed possible to ascribe to writing alone affects all signifieds in general, affects them always already, the moment they enter the *game*. (Derrida, 1977, p. 7)

Thus, Derrida begins to articulate an expansion of writing beyond the confines of the book. In fact beyond any past definition of writing. He goes on to demarcate this expanded field of "writing."

To affirm in this way that the concept of writing exceeds and comprehends that of language, presupposes of course a certain definition of language and of writing. If we do not attempt to justify it, we shall be giving in to the movement of inflation that we have mentioned, which has also taken over the word "writing," and that not fortuitously. For some time now, as a matter of fact, here and there, by a gesture and for motives that are profoundly necessary, whose degradation is easier to denounce than it is to disclose their origin, one says "language" for action, movement, thought, reflection, consciousness, unconsciousness, experience, affectivity, etc. Now we tend to say writing for that and more: to designate not only the physical gestures of literal pictographic or ideographic inscription, but also the totality of what makes it possible; and also, beyond the signifying face, the signified face itself. And thus we say "writing" for all that gives rise to an inscription in general, whether it is literal or not and even if what it distributes in space is alien to the order of the voice: cinematography, choreography, of course, but also pictorial, musical, sculptural "writing." One might also speak of athletic writing and with even greater certainty of military or political writing in view of the techniques that govern those domains today. All this to describe not only the system of notation secondarily connected with these activities but the essence and the content of these activities themselves. It is also in this sense that the contemporary biologist speaks of writing and *pro-gram* in relation to the most elementary processes of information within the living cell. And, finally, whether it has essential limits or not, the entire field covered by the cybernetic *program* will be the field of writing. (Derrida, 1974, p.9)

I seek to observe the techno-poetic mechanism through the lens of this description. This re-definition of "writing" presents a perspective that informs the construction of my generative virtual environment. It also presents a particular perspective from which to understand the work. The techno-poetic mechanism functions as a new vehicle of computer-based "inscription." From this perspective one can say that the media-elements that populate it function as language-vehicles, understanding Derrida's open definition of this term. I will spend much time articulating this expanded notion of

"language" as it pertains to the evocative nature of differing milieus of media-elements, to be mixed and explored within my generative virtual environment.

Derrida, in his text *Signature, Event, Context* also foresees an expansion of writing into complex new domains:

The representational character of the written communication — writing as picture, reproduction, imitation of its content — will be the invariant trait of all progress to come. ... Representation, of course, will become more complex, will develop supplementary ramifications and degrees; it will become the representation of a representation in various systems of writing, hieroglyphic, ideographic, or phonetic-alphabetical, but the representative structure which marks the first degree of expressive communication, the relation idea/sign, will never be annulled or transformed. (Derrida, 1988, p.5)

One central question becomes: Am I articulating a form of proto-writing with media-elements, or is this a new form of evocative exchange which can not be defined in terms of past linguistic discourse? Does this domain have a particular functionality in the transmission of meaning, that is *of itself*? As we spend more time in cyberspace, the notion of exploring the "representation of a representation" (Derrida, 1988, p.5) becomes commonplace. In fact, the computer's paste mechanism makes this relation ubiquitous within computer-based space. I have drawn from differing perspectives to inform the construction of my generative virtual environment. The complexity of the system, in terms of the production of emergent meaning, can not easily be considered from any singular direction. I will present in this document a constellation of perspectives in order to elucidate the topic and its relation to a larger world of text and media relations.

Umberto Eco's seminal text, *The Open Work* (Eco, 1989), sheds initial light on the topic. This text addresses an operative, interactive media, that is characteristic of the techno-poetic mechanism. The spatial-environmental nature of the techno-poetic mechanism enables intricate interaction and conceptual engagement with a conflation of differing language-vehicles. In particular a spatial configuration of signs contributes to the production of emergent meaning. Deleuze and Guattari succinctly define this interactive conflation, from the perspective of the enunciation:

But if the abstraction is taken further, one necessarily reaches a level where the pseudo constants of language are superseded by variables of expression internal to enunciation itself; these variables of expression are then no longer separable from the variables of content with which they are in perpetual interaction. (Deleuze and Guattari, 1987, p.91)

My generative virtual environment presents a new form of enunciation or, more accurately, a virtual inscription. Media-elements, including textual elements functioning as one example of a media-element, "are then no longer separable from the variables of content with which they are in perpetual interaction."

Deleuze, in speaking about cinematic form, points out a problem related to a conflation of languages that can be seen as insightful to the complexities of meaning production within the techno-poetic mechanism:

But even with its verbal elements this is neither a language system nor a language. It is a plastic mass, an a-signifying and a-syntactic material not formed linguistically even though it is not amorphous and is formed semiotically, aesthetically and pragmatically. It is a condition, anterior by right to what it conditions. It is not an enunciation and these are not utterances. It is an utterable. We mean that, when language gets hold of this material (and it necessarily does so), then it gives rise to utterances which come to dominate or even replace the images and signs and which refer in turn to pertinent features of the language system, syntagms and paradigms, completely different from those we started with. We therefore have to define, not semiology, but 'semiotics', as the system of images and signs independent of language in general. When we recall that linguistics is only part of semiotics, we no longer mean, as for semiology, that there are languages without a language system, but that the language system only exists in reaction to non-language-material that it transforms. (Deleuze, 1986, p.29)

Where I have chosen to frame, in part, the techno-poetic mechanism as a spatial conflation of differing language-vehicles of text, music/sound and image, Deleuze does not want to conflate the textual with the imagistic and the musical, seeing the latter two as extra-linguistic material. In some ways we could say that I have presented two differing perspectives related to understanding the production of emergent meaning through the techno-poetic mechanism: one, from the perspective of a new unformed expanded linguistics and second, from a mixed-semiotic perspective. In fact I have often stayed away from the descriptions of differing kinds of signs as presented in *Cinema 1* (Deleuze, 1986) and *Cinema 2* (Deleuze, 1989) because of the emergent nature of the sign as exemplified by the techno-poetic device; instead, focusing on Deleuze and Guattari's discussion of rhizomatic (Deleuze and Guattari, 1987, p.21), relational, mixed-semiotic (Deleuze and Guattari, 1987, p.147) methodologies as provided in *A Thousand Plateaus* (Deleuze and Guattari, 1987).

One particular approach to emergent meaning, addressing this complexity, is presented in terms of the notion of fields of meaning, where each sign carries a particular meaning force. Meaning arises as a conveyance of the summing of these forces. A set of issues surrounding this conveyance of meaning, as brought about through the observation of media-configurations, is entertained. Environmental qualities of meaning production

become a distinctive focus. The techno-poetic mechanism is loaded with specific, authored media-elements that have been informed through transdisciplinary surveys and my own art practice. Particular kinds of elemental weighting¹ heighten the possibility of generating certain forms of emergent experience and thus, emergent meaning.

The concept of the rhizome as developed by Deleuze and Guattari in *A Thousand Plateaus* is highly relevant to a discussion of a shifting configuration of media-elements, as well as a conflation of language-vehicles. The authors relate this definition:

Let us summarise the principal characteristics of a rhizome: unlike trees or their roots, the rhizome connects any point to any other point and its traits are not necessarily linked to traits of the same nature; it brings into play very different regimes of signs and even nonsign states. The rhizome is reducible to neither the One or the multiple. It is not the One that becomes Two or even directly three, four, five etc. It is not a multiple derived from the one, or to which one is added (n+1). It is comprised not of units but of dimensions, or rather directions in motion. It has neither beginning nor end, but always a middle (milieu) from which it grows and which it overflows. It constitutes linear multiplicities with n dimensions having neither subject nor object, which can be laid out on a plane of consistency and from which the one is always subtracted (n-1). When a multiplicity of this kind changes dimension, it necessarily changes in nature as well, undergoes a metamorphosis. Unlike a structure, which is defined by a set of points and positions, the rhizome is made only of lines; lines of segmentarity and stratification as its dimensions and the line of flight or deterritorialization as the maximum dimension after which the multiplicity undergoes metamorphosis, changes in nature. These lines, or ligaments, should not be confused with lineages of the abodescent type, which are merely localizable linkages between points and positions... Unlike the graphic arts, drawing or photography, unlike tracings, the rhizome pertains to a map that must be produced, constructed, a map that is always detachable, connectable, reversible, modifiable and has multiple entranceways and exits and its own lines of flight. (Deleuze and Guattari, 1987, p.21)

My investigation of emergent meaning can be seen in the light of the concept of the rhizome. The techno-poetic mechanism exhibits many of the criteria that Deleuze and Guattari describe. This mechanism enables the connection of "any point to any other point" through navigation, construction, memory and thought processes. It seeks to explore *states of meaning* where "it brings into play very different regimes of signs and even nonsign states." The non-closed nature of the system means it is not reducible to "the One or the multiple." It is a becoming one. Its importance does not lie in the units alone but "directions in motion" and configuration that give rise to an emergent series of evocations. It is inherent to an emergent space to "change in nature." It is a dynamic assemblage of media-elements and processes whose purpose is to explore "deterritorialization" as an experiential process. It is a "map that is always detachable, connectable, reversible, modifiable and has multiple entranceways and exits and its own lines of flight." Each experienced operative poetic element constitutes a potential "line of

flight" through recombination, as derived by the *vuser*. As elements are permuted and experienced, fields of meaning, through poetic construction, are placed in juxtaposition and act upon each other, causing perceptual shifts. The *vuser's* perceptual field co-mingles with the techno-poetic environment and its disruption and/or use.

Unlike the above description of the rhizome, the techno-poetic mechanism functions as a "rhizomatic" vehicle, where the computer potentially acts as a central automaton containing elements of territory and subsequent deterritorialization. Baudrillard states in *Simulation and Simulacra* that virtual space posits "the cartographer's mad project of the ideal coextensivity of map and territory." (Baudrillard, 1994, p.2) I see this as a positive attribute, where I am functioning with intention as a transdisciplinary "cartographer" to present this coextensive virtual space. One must also imagine that external to the mechanism, one can perform textual mapping, thus subtly altering this coextensive equation through conceptual layering and further textual articulation. Individual perception functions as a register of a particular territory.

A series of observations pertaining to this complex computer-based space, present a notable set of perspectives on the attributes of virtual reality. These perspectives are provided by leading theorists and artists articulating the salient features of virtual reality. Questions concerning new, expanded forms of technological authorship are addressed. The subtle notion of the relation between the map and the territory is articulated in relation to virtual space, seeing the techno-poetic mechanism as a particular form of diagrammatic environment.

A working description of the techno-poetic device grounds the initial set of conceptual approaches. This description of the device, enables the reader to begin to understand some of the computer-based environmental relations that are central to meaning production, as well as the means in which this poetic construction is facilitated.

This techno-poetic environment can produce multiple levels of abstract experience. In particular this mechanism can facilitate the poetic construction of a shifting set of aesthetic juxtapositions of media-elements. The variable results of this process, at times, suggests that the dissolution of meaning can be seen as one potential meaning state, across a set of mutable meaning states. A perspective is presented that enables an understanding of these complex configurations of media-elements, exploring particularly curious word-image relations.

Many concepts articulated by Deleuze and Guattari (Deleuze and Guattari, 1983, 1987) are seen as central to elucidating the complexities of emergent meaning production.

Their concepts are employed over the course of this dissertation and will be defined as they are encountered. In particular, Deleuze and Guattari's extensive methodology as related to pragmatics (Deleuze and Guattari, 1987, p.146), is applied as a set of elucidating approaches to my project. In each case a description outlines how these abstract concepts are functionally applied to the techno-poetic mechanism. A methodology informed by Pragmatics² both helps to define the qualities surrounding the authorship of the functionality of the device, as well as how to subsequently frame the product of that functionality — emergent meaning production.

The concept of "combinatorial constraints" (De Landa, 1997, pp.218-219) is presented as one approach to meaning production within this complex, mutable space. Another perspective is drawn from Ludwig Wittgenstein. Wittgenstein's notion of meaning in relation to language use (Wittgenstein, 1958, p.20) is seen as relevant, although different to the environmental, experiential approach to meaning explored through the techno-poetic mechanism. Media-elements are interactively encountered through a dynamic system of computer-based processes.

Operative procedures exploring dynamic juxtapositions and potential alternate juxtapositions of media-elements are central. The relevance of Eisenstein's concept of montage is pivotal. In particular, the techno-poetic mechanism functions as a vehicle for the construction of virtual-spatial-montage environments. Where traditional montage arises out of the dynamic juxtaposition of the filmic cut, generative virtual environments also bring about dynamic juxtaposition through various new technological processes.

This discussion of montage feeds into contemporary approaches to technological proto-writing, applying both montage and collage principles as filtered and re-understood through the Grammatology of Derrida (Derrida, 1977). In particular I present the relevance of Greg Ulmer's notion of *Post Criticism* (Ulmer, 1983), *Teletheory* (Ulmer, 1989) and *Applied Grammatology* (Ulmer, 1985). Ulmer functionally extends Derrida's thought and I, in turn, extend Ulmer's ideas for my own project. I continue to point toward Derrida's relevance in terms of his concept of "difference" or in French "différance" (Derrida, 1976, p.23) This concept is presented, in terms of my project, in light of the fact that emergent meaning arises out of contextual difference (différance). I will elaborate on the concept of "différance" in a later chapter.

The project outlines a series of paradoxes. The slippery nature of emergent meaning, as explored within virtual space, is rife with problems. The techno-poetic mechanism seeks to embody paradox and to enable the experiential observation of this

manifestation. It is in taking a grounded technological approach to an interactive examination of emergent meaning that makes this project distinctive.

Central to the techno-poetic mechanism is the notion of inter-authorship, where the *vuser* takes an active role in poetic construction, leading to emergent meaning production. Issues are discussed that surround the nature of the recombinant sign, particularly in relation to poetic construction. The importance of navigation to the emergent meaning processes is presented. Particular meaning arises in relation to juxtapositions which are brought about through the relative nature of varying perspectives.

The processes of probability, potentiality and chance are all germane to interactive experiences within this environment. In particular, computer-based chance processes enable probabilities of particular emergent outcomes. These approaches are not addressed through a singular fixed algorithmic apparatus within the work. Rather, interaction assumes an open form, where the *vuser* takes an active role in defining the experience. An articulation of the relevance of games and play is central to framing interactivity within the techno-poetic mechanism.

A set of focus areas has emerged from the research which has been used to inform the construction of the techno-poetic mechanism. My concept of *Re-Embodied Intelligence* can be articulated as an approach to the translation of high-level artistic processes into the generative virtual environment, where these processes can become operational, functioning as an extension of my mind-set.

My concept of *Nonsense Logic* is defined through exploring the use of pointed nonsense as a particular strategy within the techno-poetic mechanism. Puns are explored, both within the techno-poetic mechanism and as a means to address the enfolded complexities that are characteristic of the mechanism. The concept of a "punning symbolic logic" is presented, where a pun can function outwardly to the *vuser*, as part of the interface content. While, inwardly, this pun is a working element that functions in relation to and in fact is constructed of, computer code. Thus the pun becomes an operational vehicle of symbolic logic. The importance of specific-ambiguity, in terms of the authoring of media-elements, is articulated as a means of housing fields of potential conveyances for each individual media-element. This is later discussed as a means of addressing the notion of resonance in the work.

To further elucidate the construction of the techno-poetic mechanism, a series of background surveys are presented. These surveys focus on differing approaches to

emergent meaning as explored through various aesthetic, philosophical and/or generative methodologies. A survey of relevant literary, philosophical and artistic approaches to emergent meaning become one major focus area. The work of various artists is relevant to the development of my notion of the *conceptual machine*. I provide commentary on their approaches and their connection to the project. Specifically, computer code can be seen as a conceptual machine functioning within a physical one, reflecting the software/hardware paradigm. My survey of past work touches on a constellation of ideas relevant to meaning production — the image/text relations explored by Magritte, the cut-up techniques of Burroughs and Gysin, the conceptual event scores of the Fluxus artist George Brecht, the procedural formulas explored by different conceptual artists, the interactive, playful and punning approaches of Duchamp, the potentials of exploring enfolded content, new forms of spatial literary exploration, the seminal navigational poetics of Mallarmé, the larger modular-linguistic recombinational approaches of Queneau and Perec, the labyrinthine poetic articulations of meaning construction as explored by Borges, the experimental language of Joyce, the experiential, playful nature of Fluxboxes and the visionary poetic/cybernetic concepts of Roy Ascott.³ All these foci contribute to informing the construction and understanding of the techno-poetic mechanism.

The concept of the conceptual machine functions as a bridge between these multiple approaches to emergent meaning. In particular they inform the notion that the visualised conceptual machine can behave as a dynamic diagrammatic method of examining emergent meaning processes.

A history of technological systems and approaches is relevant and underscores the salient characteristics of technological devices that are functionally enfolded within the techno-poetic mechanism. Lovelace articulates the operative potentials of the device in terms of exploring emergent meaning ([Lovelace as found in]Babbage, 1961, p.249). In 1842, she posits the notion that a calculating machine could be employed to explore operative aesthetic processes. The "Universal Machine" as articulated by Turing (Hodges, 1983, p.104) presents the computer as an open device — where the functionality of the conceptual machine can be focused in any direction, in this case toward the exploration and examination of emergent meaning. Additionally, new concepts of conveyance as arising out of contemporary forms of computer-based space are articulated.

Another survey covers relevant musical and/or sonic approaches to emergent meaning related to my notion of *Recombinant Music*. The artists and methodologies discussed include: Charles Ives, who explored new forms of spatial composition and early

notions of appropriation; the Futurists for their modular noise producing machines and early experimentation into mixed media (Kahn and Whitehead, 1992, p.141); Cage for his evocative research into chance processes and a diversity of sonic methodologies (Cage, 1967); Eric Satie for his concept of Furniture Music and repetition (Battcock, 1981, p.21); Brian Eno for his extension of Satie's approaches into ambient music as well as his concept of Generative Music (Eno, 1996); the notion of operational music as articulated by William Wilson (Battcock, 1981, p.91) provides a perspective on the production of new forms of music; the advanced concepts of Propositional Music, by David Rosenboom point toward new ways of understanding sonic art practice (Rosenboom, 1993). A return to Eco further discussing musical issues from his book *The Open Work* provides additional conceptual terrain. (Eco, 1989, pp.3-4)

The functional enfolding of these diverse transdisciplinary researches is made clear within the authorship of the techno-poetic mechanism. This enfolding presents a unified field as articulated through a specific generative virtual environment — *The World Generator/The Engine of Desire*.

The operational elements of the environment are delineated. In each case the working nature of these active individual elements is defined in relation to the production and examination of emergent meaning. Interaction enables the participant to peruse combinations of functional *conceptual machines*, made operative within the computer-based environment. Interaction includes poetic construction with diverse media-elements, as well as the exploration of a series of media-processes which in-turn can act upon those media elements within the virtual environment.

The potentials of the generative environment are then analysed in a final set of foci — navigational architectures (issues surrounding navigation and its use to engender and explore emergent meaning), the definition of the dream-like nature of the environment, poetic construction (conveyed punningly) and highlights related to the importance of resonance. My intent is to show the relevance of each focus to the production and examination of emergent meaning.

The project is, admittedly, complex and I present a summation which articulates the enfolding of the varying conceptual flows that have been adapted and made operational within the techno-poetic mechanism. Thus, I will show that the techno-poetic mechanism can function as a device of discourse by observing emergent meaning that is generated through the juxtaposition and interpenetration of media-elements, as well as through related media-processes. The techno-poetic mechanism makes operative an

elaborate enfolded field of foci, examining context, decontextualisation and recontextualisation.

My research has resulted in a rich field of future exploration.

1 This kind of "weighting" is different from weighting procedures in genetic algorithms, which function at the level of computer code.

2 See also Givon, 1989, preface.

3 Brian Eno has also spoken of a related concept to that of the *conceptual machine* in his description of "Generative Music." Eno states: "One of my long-term interests has been the invention of 'machines' and 'systems' that could produce musical and visual experiences. Most often these 'machines' were more conceptual than physical: the point of them was to make music with materials and processes I specified, but in combinations and interactions I did not." (Eno, 1996, p.330)

1.0 Elucidating a Set of Relevant Perspectives

1.1 An Introduction to Concepts Relevant to an Exploration of Emergent Meaning

Contemporary artists have employed technological tools as vehicles for artistic content. Technologies have helped author new forms of art. My transdisciplinary research has drawn from many fields of study and I have sought to cross-pollinate these fields through enabling the contemporary exploration of text, image and music/sound inter-relations using technological means. In defining the word *poetic* in terms of my project, it is necessary to entertain the contemporary state of poetics as it pertains to technological-artistic production. The media-theorist Dieter Daniels provides this view:

If we seek refuge in the history of art as the responsible discipline, we discover that there is a plurality of methods and perspectives through which the history of art can be recounted. One such possibility is the development of techniques for media. Together with iconography and period history, this aspect of media history has come more and more to the fore, particularly with regard to how technologies and media influence or even determine the content of art. (Daniels, 1994, p.17)

This notion, that the content of art is shaped by technological devices, is central to the potential exploration of emergent meaning through the exploration of an artistic technological mechanism. Daniels continues:

This interrelation was apparent long before the emergence of electronic media. For example, the development of printing techniques (from wood cut, engraving and etching to screen printing and offset) is linked closely to social and political role in the arts. Since the beginning of the 20th century, an essential characteristic of the avant-garde is that artists have reacted to the demands of media in art and moreover, have purposefully altered and extended them. From the collages and montages of Cubism, Futurism and Dadaism to the new art forms of the sixties (environments, installations, multiples, performance, expanded cinema, video art) a line of development is apparent that constantly questions the role of art in a society determined by mass media. (Daniels, 1994, p.17)

In my exploration of emergent meaning, I seek to provide an artistic computer-based technological environment that "extends" the role of the *vuser*, engaging him/her in an interactive realm. The *vuser* "questions the role of art in a society" by extending the act of viewing to an active engagement through participation. Art content is generated as a product of interactive behavioural relations.

Roy Ascott saw the potentials of behavioural relations in terms of works of art. In his paper entitled *Behaviourist Art and the Cybernetic Vision*, published in 1966, Ascott presented the following concept:

Behaviourist Art constitutes, as we have seen, a retroactive process of human involvement, in which the artefact functions as both matrix and catalyst. As matrix, it is the substance between two sets of behaviours; it neither exists for itself nor by itself. As a catalyst, it triggers changes in the spectator's total behaviour. Its structure must be adaptive implicitly or physically, to accommodate the spectator's responses, in order that the creative evolution of form and idea may take place. The basic principle is feedback. The system Artefact/Observer furnishes its own controlling energy; a function of an output variable (observer response) is to act as an input variable, which introduces more variety into the system and leads to more variety in the output (observer's experience). This rich interplay derives from what is a self-organising in which there are two controlling factors; one, the spectator is a self-organising subsystem; the other, the art work is not usually at present homeostatic...

There is no prior reason why the artefact should not be a self-organising system; an organism, as it were, which derives its initial programme or code from the artists creative activity and then evolves in specific artistic identity and function in response to the environment which it encounters. (Ascott, 1966, p.11)

As computer-based systems and technological sensory extensions change our relation to both nature and language, we need to create mechanisms that function at the highest possible level of human/machine interaction, to best reflect upon this complicated plethora of emergent relations. Given the limitations of textual language to penetrate the complexity of lived experience, we need to move toward the invention of more sophisticated systems of communication that will allow us to both share and create new reflective experiences. A rich variety and intricacy of experience requires equally involved transformative technological systems to examine and explore that experience. In the light of this comment, could one seek to engender new forms of poetic expression to reflect upon the nature and construction of meaning? Might a new field of poetics actually be articulated? What historical approaches might be drawn upon to inform and define the aesthetics and relevant processes associated with this emergent field?

Seeking to explore emergent meaning within a specific generative computer-based environment is by no means a logocentric exploration. I identify the need to examine contemporary emergent environmental meaning-relations, in particular the interrelations that arise between varying media-elements within a mutable, generative virtual environment. I have ventured to isolate a series of salient approaches, symptomatic of problems and potentials encountered when addressing the nature of emergent meaning. I have also sought to point toward a particular transdisciplinary set of individual instances involving relevant exploration of emergent meaning. Instead of attempting to

constrain the authorship of my techno-poetic mechanism to text-based meaning, I have sought to explore a mixed-semiotic (Deleuze and Guattari, 1987, p.147) environment of media-elements.

My generative cyber-polysemic mechanism seeks to enable the exploration of meanings that arise through the juxtaposition and interpenetration of digital media-elements and processes. I am also interested in a series of behavioural processes that provide the means for generating further complexity within this interactively assembled computer-based environment.

We can say that the change of "state" in a media-element is brought about by computer-based environmental factors. Heraclitus' universal flux is particularly relevant to the processes of becoming that characterise the techno-poetic mechanism; where the flow of media events, brought about through the interaction of the viewer/user of the system, defines a fluctuating yet coherent body. The following observations are attributed to Heraclitus from the 6th century B.C., with commentary by Philip Wheelwright.

Everything flows and nothing abides; everything gives way and nothing stays fixed.

You cannot step twice into the same river, for other waters are continually flowing on.

It is in changing that things find repose. (Wheelwright, 1968, p.29)

Wheelwright muses:

Permanence is but a relative term, his [Heraclitus', emphasis Seaman] philosophy declares; and what we call permanent is simply an example of change in slow motion. All structures, if you observe them patiently enough and project your imagination far enough, are dissolving slowly; everything, as the Greeks put it, is in a process of coming-to-be and passing-away. (Wheelwright, 1968, p.29)

The techno-poetic mechanism seeks to illuminate processes of change — configurations of media-elements "coming-to-be" and "passing away" within an advanced technological environment. While the environment undergoes change, meaning becomes accretive. In examining language-vehicle use, I argue that context is central to the generation of meaning. I show that meaning can be seen as ambiguous, indefinite and constantly in flux. This is particularly relevant to mutable, computer-based environments and to the nature of the recombinant sign. Reconfigurable contexts are continually entertained in the *negotiation*¹ of meaning. This is not only true within the techno-poetic mechanism, it perhaps characterises all language use. Thus, the *vuser*

(viewer/user) negotiates this mutable landscape of media-elements. This punny *negotiation* is both spatial and conceptual. In a virtual environment, meaning is no longer simply conveyed through chains of words. It is now circulated through the negotiation of virtual volumetric flows.² These flows are potentially polyvalent and ambiguous within the device, seeing these characteristics as central to poetic approaches to the contemporary production of meaning. This often includes puns functioning to bridge multiple perspectives, where appropriate, i.e., the word *negotiation* used above.

Initially a model for this technological/artistic mechanism was created. The research sought to define the computer-based functionality (that this apparatus should embody, informed partially by the study of relevant technological mechanisms), develop a working prototype of the software interface, develop a working prototype of hardware interface, test and re-test the prototype, revise the mechanism and extend the functionality of the prototype, based on the findings of the tests and to develop a working prototype, housing specific elements of image (still and time-based), music/sound elements and textual elements, informed by the study of art practice deemed relevant to the project.

My investigation has identified the need for the creation of a functional mechanism to enable the examination of specific forms of emergent computer-based environmental meaning. The techno-poetic mechanism addresses the complex nature of context as generated through interaction with technological-media in an experiential manner. One can even question the very definition of context, especially in terms of the both fleeting and spatial nature of virtual environments. Derrida, in *Signature, Event, Context*, suggests the following about this problem:

But are the conditions of a context ever absolutely determinable? This is, fundamentally, the most general question that I shall endeavour to elaborate. Is there a rigorous and scientific concept of context. Or does the notion of context not conceal, behind a certain confusion, philosophical presumptions of a very determinate nature? Stating it in the most summary manner possible, I shall try to demonstrate why a context is never absolutely determinable, or rather, why its determination can never be entirely certain or saturated. 1) it would mark the theoretical inadequacy of the current concept of context (linguistic or non-linguistic), as it is systematically associated; 2) it would necessitate a certain generalisation and a certain displacement of writing. This concept would no longer be comprehensible in terms of communication, at least in the limited sense of a transmission of meaning. Inversely, it is within the general domain of writing, defined in this way, that the effects of semantic communication can be determined as effects that are particular, secondary, inscribed and supplementary. (Derrida, 1988, p.3)

Derrida, well versed in polysemic language use, points to the ambiguity of "context." I will engage the differences between virtual reality and the printed page from various perspectives, keeping in mind that the nature of context within the techno-poetic mechanism is complex. The mechanism enables a *vuser* to choose from an elaborate menu of media-elements and to construct virtual media-worlds in real time. The *vuser* can subsequently navigate within this generated media-environment. A series of behavioural media processes are also enabled within the work. Contextualisation, decontextualisation and recontextualisation of specific media-elements are addressed in the discussion.

I have sought to develop a unified approach, to address and enfold both technological and artistic concerns. The research has suggested an emergent poetic field — recombinant poetics. This techno-poetic discourse, still forming, functions as the enabling approach to specific instances of computer-based interactivity, facilitating an operative exploration of emergent meaning within generative contexts.

I have examined the following research areas through textual discourse as related to the technological/artistic device: The nature of evocation as examined within an emergent, interactive context; the generation of context facilitated through the operative juxtaposition of "user" chosen elements of image, text and music/sound, within a computer-based environment; user/viewer (*vuser*) relations, including an examination of interaction, navigation and inter-authorship; aesthetic relations; philosophical relations, culminating in the discussion of a recombinant poetic network of interrelations — a unified field.³

Sergei Eisenstein yearned "towards a purely intellectual film, freed from traditional limitations, achieving direct forms for ideas, systems and concepts, without any need for transitions and paraphrases." (Eisenstein, 1949, p.63) I have attempted to nest many filmic concepts drawn from Eisenstein within the techno-poetic mechanism; the techno-poetic mechanism is a device that generates a mixed semiotic spatial montage. In speaking about film, Eisenstein stated: "We may yet have a synthesis of art and science." (Eisenstein, 1949, p.63) It is a similar synthesis that I have also sought to articulate in theory and through art practice.

Informed by the research, I have sought to facilitate the following: to make the prototype functional through the generation of computer code; to study and generate a relevant set of media elements of image, music/sound and text to be explored within the operative techno-poetic mechanism; to present a mechanism that enables *vusers* to make specific combinations and recombinations of chosen and constructed elements,

interactive, exploring emergent meaning in an experiential manner; to enable interactivity with intuitive ease; to enable the *vuser* of this techno-poetic mechanism to make other functional choices from an operative menu system; to enable the *vuser* to navigate within the derived 3D space as one aspect of the exploration of emergent meaning; to enable the *vuser* to attribute a digital media-behaviour to an object, image or text and to witness how that behaviour shifts or augments meaning; and to enable the participant to explore elaborate pre-defined media processes.

The computer, through its multiple interactive functionalities, enables the generation of an emergent landscape of language-vehicle use. The *vuser* becomes highly engaged with an exploration and production of meaning. This mutable network of media-elements, made up of a multiplicity of sign *milieus*, are co-mingled within the techno-poetic mechanism and become interactively operable. Julia Kristeva has articulated her notions of *inter-textuality* and transposition. In *Revolution in Poetic Language*, she speaks about material that passes from one sign system to another:

To be sure, this process comes about through a combination of displacement and condensation, [see Interpretation of Dreams (Freud, 1970, p.313) emphasis Seaman] but this does not account for its total operation. It also involves an alteration of the thetic position- the destruction of the old position and the formation of a new one. The new signifying system may be produced with the same signifying material; in language for example, the passage may be made from narrative to text. Or it may be borrowed from different signifying materials: the transposition from a carnival scene to the written text, for instance. In this connection we examined the formation of a specific signifying system-the novel- as a result of a redistribution of several different sign systems: carnival, courtly poetry, scholastic discourse. The term *inter-textuality* denotes the transposition of one (or several) sign system(s) into another; but since this term has often been understood in the banal sense of "study of sources," we prefer the term transposition because it specifies that the passage from one signifying system to another demands a new articulation of the thetic — of enunciative and denotative positionality. If one grants that every signifying practice is a field of transpositions of various signifying systems (an *inter-textuality*), one then understands that its "place" of enunciation and its denotated "object" are never single, complete and identical to themselves, but always plural, shattered, capable of being tabulated. In this way polysemy can also be seen as the result of a semiotic polyvalence — an adherence to different sign systems. (Kristeva, 1984, p.60)

I extend a reading of Kristeva's terms into an extra-linguistic arena, and intend to probe the ramifications of this in the chapter entitled "A Conflation of Language-Vehicles." I will also talk about the notion of fields of meaning, as produced through the inter-penetration of the differing conveying systems of text, image (both still and moving) and music/sound, in the chapter entitled "Fields of Meaning — An Emergent Approach to the Perception of Context." I articulate the notion that the *vuser* brings a mind-set, as another activated field, into this equation, where meaning forces are summed. The

techno-poetic mechanism is a device to experientially explore aspects of "intertextuality;" to produce and examine emergent meaning. The *vuser* actively explores how "a new signifying system may be produced with the same signifying material," "through a combination of displacement and condensation." We could say that meaning always arises "as a result of a redistribution of several different sign systems." Where Kristeva is pointing toward the transposition of different sign systems into one unifying textual system, I am suggesting an expanded notion of intertextuality which explores mixed-semiotic reorganisations.

Although inter-textuality is borrowed from linguistics, I am seeking to move beyond a purely logocentric approach to language. Kristeva, in the book *Language*, speaks about a potential shift in the very definition of linguistics, one that recognises the complexity of the active engagement of the individual in the production of meaning:

This schematic summary of several of the fundamental principles of the analytic conception of language and their radical novelty with respect to modern linguistic vision, inevitably raises the question of whether they can be introduced into linguistic knowledge. We are not able today to foresee the possibility, much less the result, of such a penetration. But it is obvious that an analytic attitude toward language will not spare the neutral systematicity of scientific language and that it will force formal linguistics to change its discourse. What seems even more probable is that an analytical attitude will invade the field of study of signifying systems in general, the semiology Saussure dreamed of and that, from that angle, it will modify the Cartesian conception of language and enable science to grasp the multiplicity of signifying systems elaborated in and from *la langue*. (Kristeva, 1989, pp.276-277)

My techno-poetic mechanism seeks to explore virtual terrains of language use, incorporating media-elements as language-vehicles to define a new form of poetics, as well as to present a computer-based platform for the examination of operational meaning production. This heightens the role of the reader/*vuser*, where through interactivity a new form of discourse mechanism is entertained. I have sought to enable the dynamic observation of emergent meaning through the evocative nature of a mixed-semiotic landscape — a mutable space of becoming. My device seeks as its central mission an experimental "penetration" through traditional bounds of linguistic inquiry into a poetic realm of experiential discourse, exemplifying an expanded approach to "linguistic knowledge" through recombinant poetics.

1 See Roy Ascott's text where he also uses the term "negotiation" in a related punning manner (Ascott, 1985, p.51).

2 Deleuze and Guattari often use the term "flow " to describe particular kinds of experience (Deleuze and Guattari, 1987, p.4).

3 The prototype/art work has been exhibited in both the context of the European IT (Information Technology) Conference as well as within the art context, in a series of exhibitions (please see a listing in the appendix).

1.1.1 Issues Surrounding the Definition of Poetics

I am exploring a contemporary application of the word "poetics." The definition needs to be seen as an art practice which examines what *Webster's New Universal Unabridged Dictionary* calls "imaginative" relationships created during the simultaneous exploration of elements of language, image and music/sound within a computer-based, digital environment. It needs to be read in the light of art practice during and at the end of the twentieth century as well as in relation to the germination of a "poetic" practice stretching well into the twenty-first. This study is post-Duchampian and post-Cageian because of its virtual computer-based orientation. Although, this project is highly influenced by their practice. I will discuss both Duchamp and Cage in the chapter entitled "A Survey of Relevant Literary, Philosophical and Artistic Approaches." Duchamp and Cage greatly expanded the scope of what might be considered "poetic" as well as "expand[ed] the field of possibilities for making art." (Rosenberg, 1991) I here seek to continue that expansion into virtual, technological realms.

Eric Vos, in special issues of the journal *Visible Language*, edited by Eduardo Kac, in a text entitled "New Media Poetry – Theories and Strategies," provides the following definition of "New Media Poetry:"

New Media Poetry is innovative poetry created and experienced within the environment of new communication and information technologies — and it could not have been created and cannot be experienced in other environments. It is a poetry based on the integration of characteristic features of these technologies in the strategies that underlie the writing and reading of poetic texts. In terms of labels often attached to new media, we are dealing with a virtual, dynamic, interactive, immaterial poetry.

We shall try to develop an account of the basis of new media poetry, or at least sketch the contours thereof. We call this basis theoretical rather than poetical because it expands the habitual domain of poetics to include considerations of communication and information theory, semiotics and interart relationships. (Vos, 1996, pp.216-217)

This definition is to a large extent exemplary in terms of my own goals, although I do not value written and/or spoken text above other media-elements in a hierarchical manner within my own poetic works. Recombinant poetics is not primarily a logocentric poetics. The techno-poetic mechanism embodies a conflation of logocentric and non-logocentric language-vehicles. It is by all means an "interart" poetic that I refer to. Vos later goes on to talk about the generative nature of this form of poetics:

New Media Poetry offers the reader the opportunity, the means and the information (e.g. the digital data) to bring a text into virtual existence. In new media poetry, the poetic text is not already there; it is not a package for but a parameter of the poetic communication process. (Vos, 1996, p.219)

This strategy is central to my project; emergent meaning is brought to light through a "virtual existence." Jim Rosenberg, a writer and theorist exploring hypertext as a medium suggests the following about poetics:

Personal Notes on Poetics: Openness

Poetry is not a circumstance of language. Rather, any possible circumstance of language is a possible circumstance of poetry. It is the job of the poet to invest that circumstance with energy. It is the job of the receiver to be open-minded about what circumstances of language may constitute poetry. This is the exact analogue of the idea that the domain of music is anything which may be heard, or that the domain of the visual arts is anything which may be seen. The page may be a wall or a computer screen or a street or a floor with words glued together in a pile so that not all of them can be read. This is not meant in any way to disparage the traditional page. If there can be such a thing as a conscientious avant-garde, then surely its purpose must be to expand the field of possibilities for making art, not to replace the existing set of possibilities with a new one, equally narrow. The house of poetry has room for everyone. (Rosenberg, 1991)

The field of recombinant poetics seeks to enfold the disciplines of poetry and/or experimental text, the visual arts, music and sound art. I agree with Rosenberg's observations about music and visual art. Like Rosenberg, I do not wish to "disparage traditional forms." I seek to operate in the tradition of the avant-garde, expanding "the field of possibilities." Central to recombinant poetics is the exploration of a plethora of new "poetic" technological relations.

My research has made explicit the need to articulate a particular field that enfolds a series of divergent researches. To explore emergent meaning as artistic subject matter. I have sought to enfold these researches into the construction of the techno-poetic device and call this emergent field recombinant poetics, a term used throughout the dissertation. I initially employ it as an umbrella-term, a name that seeks to envelope the divergent/emergent nature of this study. The word "recombinant" is used in a metaphoric and poetic manner. In a scientific context it is defined as:

Recombinant :

Any new cell, individual, or molecule that is produced in the laboratory by recombinant DNA technology or that arises naturally as a result of recombination. (Parker, 1989)

Recombinant DNA technology can be defined as:

In genetic engineering, a laboratory technique used to join deoxyribonucleic acid from different sources to produce an individual with a novel gene combination. Also known as gene splicing. (Parker, 1989)

A provisional definition of the term "recombinant poetics" follows. Art works which exemplify recombinant poetics are characterised by the interaction of a *vuser* with a computer-based mechanism that enables her/him to become actively engaged with aspects of experience arising from the combination and recombination of text, image and/or music/sound elements. The functionality of this mechanism is made operative within an authored computer-based generative environment. It is the technological functionality of this mechanism that enables direct engagement with digital media-elements. These modular variables of text, image and music/sound can be observed as fields of meaning experienced within a variety of constructed contexts through processes of interaction. It must be noted that in this case a recombinant poetic work is specifically being authored to examine emergent meaning. The techno-poetic mechanism generated for this research has other functional potentials that will be elucidated in the chapter entitled "Future Research." I will also articulate notions surrounding the concept of "Fields of Meaning" in a subsequent chapter.

In terms of the applied definition of the term recombinant, the user of this techno-poetic mechanism metaphorically "splices," "combines," and/or "recombines" media-elements to create "novel" combinations, producing new "media-molecules." The metaphor of the molecule is relevant in that emergent forms can arise out of the combination and recombination of otherwise distinct modular media-elements potentially functioning in conjunction with media-processes and/or behaviours attributed to those media-elements.

I see my device as providing the means for experiencing a poetic-becoming. It is informed in an ahistorical manner, drawing and abstracting modes of relation from a series of transdisciplinary milieus. The experiential nature of this project takes it beyond the postmodern, where the techno-poetic mechanism functions as a vehicle of serious research and transdisciplinary inquiry, while simultaneously functioning as a work of art. The *vuser* of my system potentially becomes "mindfully aware" of personal observations during use, exemplifying processes and characteristics which are also elucidated textually in this dissertation. Varela, Thompson and Rosch in *The Embodied Mind*, speaking about Buddhist mindfulness/awareness suggest:

Its purpose is to become mindful, to experience what one's mind is doing as it does it, to be present with one's mind. What relevance does this have to cognitive science? We believe that if cognitive science is to include human

experience, it must have some method of exploring and knowing what human experience is. (Varela, Thompson, and Rosch, 1996, p.23)

As an artist and researcher I am also interested in this particular state of mind.

Engagement with this mutable computer-based environment enables the *vuser* of my mechanism to experience, in a mindfully aware manner, a series of emergent meaning processes that are predicated upon the *vuser's* participation. It is from the perspective of mindfully aware observation that one can potentially explore my techno-poetic device, examining the functionality of this mechanism through direct interaction. The mechanism enables the examination of specific instances of media-use that are relevant to a contemporary exploration of a particular technological-environmental context, as a vehicle of abductive logic. The spatial nature of this engagement with context brings about the experiential observation of complex emergent media-relations over time and as such, the concomitant meanings generated through this engagement. The resulting enfolded art work/discourse mechanism facilitates navigation, *poetic* media-construction and other aesthetic and behavioural processes described below.

The techno-poetic mechanism facilitates new aesthetic experiences within a computer-based virtual world, enabling reflection on particular aspects of mutable "environmental" poetic media-relations. The participant becomes actively engaged with behavioural experience through interaction. In fact, the poetic content of the work is a product of the interaction that takes place between the user of the mechanism and the media-elements and processes that have been "embodied" or housed within that mechanism. I will later discuss my concept of "Re-Embodied Intelligence" in the chapter of the same title.

As we seek to expand the field of poetics, we must observe the fact that contemporary art practice is in a continuous state of redefinition. An operative contemporary definition of poetics has to include that which the artist deems as poetic. The intention of the artist, functioning in complex relation to the reception and motivated action of the *vuser* exemplified within a specific recombinant poetic system, forms a dynamic relation exploring emergent meaning. Thus, the techno-poetic mechanism explores the poetics of relativity inherent to particular forms of emergent media-relations.

The computer enables the realisation of a highly specific, interactive mechanism that opens up new realms of poetic exploration. This list of salient properties exemplifies the following areas of investigation: virtual navigation of poetic environments, 3D inter-authorship of poetic text within a spatial environment, poetic construction mechanisms that are both chance¹ oriented and/or viewer driven; location sensitive audio-

environment construction, semi-aleotonic, locational and *vuser* derived sonic events, music and text that is played/triggered when a *vuser*/listener moves within a virtual proximity to the particular object, the manifestation of aesthetic attached spatial behaviours which act upon media-elements creating an emergent kinetic space, the possibility of media-elements responding to the *vuser* in some designated and potentially *intelligent*² manner, and abstraction processes that enable the *vuser* to make elements transparent, change scale and/or height (elongation). We can also explore this generative virtual environment, as a networked³ experience, enabling *vusers* in two different locations around the globe to inhabit the same virtual space and to jointly explore, interact and construct within the environment.

As stated above, the configuration of signs is not merely linguistic in the traditional, textual sense. The possibility for a related spatial form of poetic construction was discussed by Bolter writing on hypertext:

In place of hierarchy, we have a writing that is not only topical: we might also call it "topographic"... It is not the writing of a place, but rather a writing with places, spatially realised topics... The writer and reader can create and examine signs and structures on the computer screen that have no easy equivalent in speech. (Bolter, 1991, p.25)

When 2D "topographic" spatial interaction is extended into virtual space, new spatial-poetic domains emerge, yielding many technological and poetic relationships of significance. In the techno-poetic mechanism, interactive technology has enabled the exploration of text in a virtual 3D space, in conjunction with other operative poetic elements of sound and image that can be dynamically recombined.

The techno-poetic mechanism is an operational mixed-semiotic "transposition" engine (Kristeva, 1984, p.60). Where a pure semiotic (as discussed by Kristeva) would primarily be exhibited on the plane of the textual, my computer-based engine enables us to experience acts of "transposition" as encountered through experiential interactive processes. The *vuser* acts upon poetic media-elements and much like in the "Dream Work" discussed by Freud, (Freud, 1970, p.313) she/he encounters media-elements housing fields of condensed meaning, as well as elements that are encountered through computer-based displacement. This conceptual condensation is unfolded within the thought processes of the *vuser* during and after time-based interaction. These sign systems, enfolded across the multiple semiotic *milieus* of text, music/sound and still and time-based images extend the dynamic that Kristeva points toward, intermingling various levels or qualities and meta-levels of symbolic space. The generative virtual environment functions as an embodied pun on the notion of symbolic spatial relation.

Interaction within the environment creates an abstracted space not unlike the space of a dynamic, mutable multi-valent rebus. The techno-poetic environment is semiotically more like a dream than the description of a dream. I will elaborate on this notion in a subsequent chapter. Kristeva articulates in the following passage, her own debt to Freud:

Represent ability [this is how Kristeva spaces the word(s), emphasis Seaman] comes about through a process, closely related to displacement but appreciably different from it, that Freud calls "ein Vertauschung des sprachlichen Ausdrucks." We shall call *transposition* the signifying process' ability to pass from one sign system to another, to exchange and permute them; and *represent ability* the specific articulation of the semiotic and the thetic for a sign system. Transposition plays an essential role here inasmuch as it implies the abandonment of a former sign system, the passage to a second via an instinctual intermediary common to the two systems and the articulation of the new system with its new represent ability. (Kristeva, 1984, p.60)

The techno-poetic mechanism presents an environment of operative "represent ability," where the *vuser* encounters a series of different semiotic potentials through the functionality of the authored program, an engine of mixed-semiotic inter-textuality. Another term developed by Kristeva relevant to this discussion is "signifiante:"

What we call signifiante, then is precisely this unlimited and unbounded generating process, this unceasing operation of the drives toward, in and through language; toward, in and through the exchange system and its protagonists-the subject and his institutions. This heterogeneous process, neither anarchic, fragmented foundation nor schizophrenic blockage, is a structuring and de-structuring practice, a passage to the outer boundaries of the subject and society. (Kristeva, 1984, p.17)

The functionality of the techno-poetic "transposition" system enables us to explore meta-"signifiante" within a specific interactive/behavioural environment. It is outside the scope of this paper to develop an entire psychoanalytic⁴ approach toward the understanding of the techno-poetic mechanism. This dynamic machine of poetic passage, an environment of high-level symbolic exchange, moves toward boundaries that possibly Kristeva was not even considering. Although in her text *Desire in Language: A Semiotic Approach to Literature and Art* (Kristeva, 1980), she provides some thoughts on a set of alternate languages. Kristeva defines her concept of the "thetic phase":

We shall call the break, which causes the positing of signification, a thetic phase. All enunciation, whether of a word or of a sentence, is thetic. It requires an identification; in other words the subject must separate from and through his image, from and through his objects. This image and objects must first be posited in a space that becomes symbolic because it connects the two separated positions, recording them or redistributing them in an open combinatorial system. (Kristeva, 1984, p.43)

My device produces a cycling through of "thetic" phases, alternating between smooth and striated spaces (Deleuze and Guattari, 1987, p.474), in which we initiate choices to produce this "break" through the functionality of the system and in turn cause "the positing of a signification" as one function of participatory poetic construction; or we navigate the space that contains this construction, forming other "thetic" qualities through virtual spatial perspective. It is an "open combinatorial system," albeit limited by the media-elements that become operative through its use.

Combinatorial strategies have had a long history in the context of art, to be discussed in the chapter entitled "A Survey of Relevant Literary, Philosophical and Artistic Approaches." More recent exploration of combinational aesthetics will be discussed in the chapter entitled "A Selection of Hybrid Technological, Literary and Artistic Works — Toward the Definition of a Field: Recombinant Poetics."

The interactive recombinant environment I propose is both positive, in that extends contemporary notions related to the very definition of art, and problematic, in that it challenges the behaviour of most traditional viewers/readers. Many viewers do not wish to engaged in this kind of interactivity, or, informed by their exploration of other media, they have acquired expectations about what this engagement should be like. For the *vuser*, this mechanism also involves a new relationship to the suspension of disbelief, which is characteristic of filmic practice. One is not engaged by an authored plot and/or fixed series of events. The *vuser* of the system generates the experience in an act of inter-authorship with the author of the mechanism and/or other *vusers* simultaneously exploring the system. Both the social function of art and the role of the "viewer" is shifted in relation to the form of engagement. Thus, this "new medium asks for a new definition of the social role and aesthetic function of art." (Daniels, 1994, p.17)

The computer can facilitate the creation of non-linear structuring mechanisms enabling the *vuser* to interact with media-elements and processes in the work of art in a direct manner. The work presents a means to navigate amidst images composed of pure light, experienced in conjunction with a shifting digital soundscape. It offers an entirely new means of authorship and inter-authorship and a paradoxical vehicle of media containment that is exemplified by non-closure. The computer is a perfect vehicle for accessing digital video material. It is also an excellent spatial structuring device for digital video and other electronic media. Authored technological environments enable the *vuser* to explore expressive material through mechanisms that carry and release layers of content during and after interaction.

Central to new forms of contemporary art are computer-based art works that enable the exploration of new forms of emergent content, where each *vuser* has a different experience. This extends Derrida's notion of "Difference," ("Différance") where meaning always arises based on differing contextual relations. I elaborate on Derrida's concept of Difference (Derrida, 1976, p.23) in the chapter entitled "Fields of Meaning - An Emergent Approach To The Perception of Context." Derrida encapsulates this notion of emergence and "illimitable" mutability of the sign in this remark:

Every sign, linguistic or non-linguistic...can...break with every given context, engendering [and inscribing itself in] an infinity of new contexts in a manner which is absolutely illimitable. (Derrida, 1988, p.79)⁵

It is the experiential recognition of this fact, also articulated by Peirce (Peirce, 1931, p.171), that the techno-poetic mechanism seeks to exemplify in order to generate and explore emergent meaning. Perhaps this was what Heraclitus, a philosopher with an interest in paradox, was referring to when he said, "Into the same rivers we step and do not step." (Wheelwright, 1968, p.90) The non-closure of the techno-poetic device articulates a related paradox.

1 These chance operations rely on computer-based random number functions within particular numerical ranges. They are not purely random by any means. In fact, they focus a particular intentionality: the exploration of a specific form of programmed variation.

2 I speak about the notion of intelligence at length in the chapter "Re-embodied Intelligence." There is great debate over attributing intelligence to computers. I am interested in attributing intelligence to programmers and system designers. Yet, one may see highly-autonomous, seemingly intelligent computer-based systems in the not-to-distant future.

3 The Centre for Art and Media (The ZKM), led by Jeffrey Shaw, has been central in supporting and facilitating this networked version. Connections have been facilitated between Tokyo, Japan and Karlsruhe Germany; Brussels, Belgium and Karlsruhe; England and Karlsruhe; and Le Fresnois, France and Karlsruhe.

4 See also the writings of Arrivé, 1992, and the oeuvre of Jacques Lacan.

5 This particular passage was suggested to me by Angela Moorjani. See her paper *Peirce and Psychopragmatics: Semiosis and Performativity* forthcoming in *Peirce, Semiotics and Psychoanalysis*, ed. by John P. Muller and Joseph Brent. Baltimore: John Hopkins University Press.

1.1.2 Approaches

The computer-based poetic mechanism authored¹ in conjunction with Gideon May experientially embodies research relevant to the examination and exploration of emergent meaning. This technological environment invites the active engagement of the participant through the perception of configurations of media-elements within a non-fixed constructed and inter-authored technological context. The *vuser* of the system is empowered to interactively assemble a media-environment with a set of pre-authored, modular aesthetic media-elements. The participant witnesses first-hand the complexity

of media-relations inherent to the environment, used to construct differing or alternate contexts.

It must be noted that each form of media-element could potentially be considered as a "language" element by applying different readings or strands of the definition of "language" as derived from *Webster's New Universal Unabridged Dictionary*. The system does not seek to function in terms of defining the smallest elements of potential signification. In a later chapter entitled "A Conflation of Language-Vehicles." I will further develop this concept. The following definition of language is helpful to this process:

Language:

1. (a) the expression and communication of thoughts and feelings by means of vocal sounds and combinations of such sounds, to which meaning is attributed; human speech; (b) the ability to express or communicate by this means; (c) the vocal sounds so used or the written symbols for them.
2. any means of expressing or communicating, as gestures, signs, animal sounds, etc.
3. all the vocal sounds, words and the ways of combining them common to a particular nation, tribe or other group, etc.; as the English Language.
4. (a) the particular form or manner in selecting and combining words characteristic of a person, group, etc.; form, style, or kind of expression in words; as the language of poetry; (b) the particular words or phrases of a profession, group etc.; as the language of the army;
5. the study of language in general or of some particular language or languages; linguistics.

The emergent field of recombinant poetics seeks to draw from these definitions of language, conflating the use of various kinds of language-vehicles to explore emergent meaning. These include the following:

- standard text, both written and spoken;
- poetic text rendered in a 3D virtual environment;
- images, both still and time-based, exemplifying the following section of the definition — "any means of expressing or communicating, as gestures, signs, animal sounds, etc.;"
- music — also exemplifying "any means of expressing or communicating, as gestures, signs, animal sounds;"
- computer code which exemplifies "the particular words or phrases of a profession, group etc."

For each of these strands of "language" use we necessarily develop our own perceptual understanding. In the techno-poetic environment, these language-vehicles can be enfolded and modify or qualify each other. We draw on our understanding of each separate "language" use within a particular context and sum up our perceptions to derive meaning.

Rudolf Arnheim in *Toward a Psychology of Art* speaks about perceptual abstraction and art:

My assertion is that the individual stimulus configuration enters the perceptual process only in that it evokes a specific pattern of general sensory categories, which stands for the stimulus in a similar way in which in a scientific description a network of general concepts is offered as the equivalent of a phenomena of reality. Just as the very nature of scientific concepts prevents them from ever seizing the phenomenon "itself," percepts cannot contain the stimulus material "itself," either totally or partially. The nearest a scientific description can get to an apple is giving the measurements of its weight, size, shape, location, taste, etc. The nearest a percept can get to the stimulus "apple" is representing it through a specific pattern of such general sensory qualities as roundness, heaviness, fruity taste, greenness, etc.

If this theory be acceptable, the elementary processes of perception, far from being mere passive registration, would be creative acts of grasping structure, even beyond the mere grouping and selecting of parts. What happens in perception is similar to what at a higher psychological level is described as understanding or insight. Perceiving is abstracting in that it represents individual cases through configurations of general categories. (Arnheim, 1966, p.33)

The techno-poetic device enables one to observe changes in the nature of the computer-based environment and to become self-reflective upon how this impacts on the configuration of "general categories" employed in thought processes. We can say that the techno-poetic mechanism seeks to present a generative computer-based environment that explores and experientially enables the observation of emergent meaning, arising as an ongoing set of evoked and/or conveyed conceptual abstractions. It is outside of the scope of this paper to present a breakdown of the actual perceptual processes that are active during the observation of the techno-poetic mechanism.

¹ I am the originator of the concepts embodied in the techno-poetic mechanism, including all of its functionality. I composed the sound elements, wrote the poetic text, made the 3D models, shot the video segments, defined the behaviours and created the stills. Gideon May put huge effort into the writing of the complex code, bringing the work to the functioning stage, and essentially making it operable. May has also facilitated the networked functionality of the work in conjunction with my visualising concepts. May earlier worked with Jeffrey Shaw on a networked virtual project.

1.1.3 Some Observations About the Sign, Emergent Meaning and Environmental Computer-Based Context

In his text "Phenomenology and Psychology" from the book *Phenomenology and the Social Sciences*, Eugene T. Gendlin makes this observation about experience:

The crucial problem has two parts: (1) If experience is not like a verbal scheme and we do not wish to say that it is, then how can we say anything at all about it without imposing a verbal scheme? and (2) If we wish, in some way, to appeal beyond logical schemes to a sense of "experience" not yet organised verbally, in what way do we have such "experience" present and available for appeal and in

what way does experience give "yes" or "no" answers, so that some statements will be "based" on it and some statements not. (Gendlin, 1973, p.282)

It is this very question that suggests the need to construct a technological device to approach particular qualities of experience. We begin with one very large problem. Meaning itself is extremely difficult to define. The notion of approaching *emergent* meaning furthers this problem. By acknowledging this problem, I seek an appropriate methodology. I first suggest that instead of trying to define meaning, I merely point at and carefully approach aspects of its nature. The question then becomes, how might one define a mechanism that can aid in this kind of examination?

Saussure made the following comment about signs in his *Course in General Linguistics*:

Language is a system of signs that express ideas and is therefore comparable to a system of writing, the alphabet of deaf-mutes, symbolic rites, polite formulas, military signals, etc. But it is the most important of all of these systems.

A science that studies the life of signs within society is conceivable; it would be part of a social psychology; I shall call it semiology (from the Greek "sign"). Semiology would show what constitutes signs, what laws govern them. Since the science does not yet exist, no one can say what it would be; but it has a right to existence, a place staked out in advance. Linguistics is only part of the general science of semiology; the laws discovered by semiology will be applicable to linguistics and the latter will circumscribe a well-defined area within the mass of anthropological facts. (Saussure, 1959, p.16)

The techno-poetic mechanism seeks to enable the observation of the complex use of signs within a generative virtual environment. Although Saussure valued language as "the most important of all of these systems," it is the nature of computer technology to extend the potentials of language through the intermingling of differing sign systems, thus enabling a non-logocentric approach to sign configurations. This both entails an expansion of linguistics and semiotics.

Language functions through an infinity of referrals and relativities. Charles Sanders Peirce, considered the founder of semiotics (Lechte, 1994, p.145), speaks here about meaning processes:

A sign [or representation] stands *for* something *to* the idea which it produces, or modifies. Or, it is a vehicle conveying into the mind something from without. That for which it stands is called its object; that which it conveys, its meaning; and the idea to which it gives rise, its interpretant. (Peirce, 1931, p.171)

We can infer from Peirce's statement that meaning is that which the sign conveys. It is a simple, clear, elegant thought. In his next paragraph, Peirce points toward part of the problem:

But an endless series of representations, each representing the one behind it, may be conceived to have an absolute object at its limit. The meaning of a representation can be nothing but a representation. In fact it is nothing but the representation itself conceived as stripped of irrelevant clothing. But this clothing never can be completely stripped off; it is only changed for some more diaphanous. So there is an infinite regression here. Finally, the interpretant is nothing but another representation to which the torch of truth is handed along; and as representation, it has its interpretant again. Lo, another infinite series. (Peirce, 1931, p.171)

One finds infinite regression to present a salient problem surrounding the study of meaning. I must again state that emergent meaning can only be pointed at through language in that it arises in the mind of the *viewer* in relation to the experience of particular contexts. This fact suggests the need to generate a mechanism that can function as a higher order language, a meta-language, to better gesture toward the nature of emergent meaning through the construction and differentiation of context. This does not solve the problem of elucidating the complex problematics surrounding discussions of meaning; it does, however, enable a higher-order approach toward the observation of the emergence of meaning, within a mutable computer-based context. We can tend toward a better elucidation of the problems surrounding emergent meaning, although it appears that there will always be another meta-level above a given approach. This again reflects the infinite regression of Peirce's remark.

When we focus on the history of the sciences¹, a set of disciplines that thrive on facts and empirical processes, we certainly must register a series of on-going changes that seek to characterise the meaningful understanding of the world. In the face of an impossible definitive fixity, how can one begin to address the nature of emergent meaning through a work of art? As earlier stated, Derrida points at the nature of this "illimitable" (Derrida, 1988, p.79) mutability in relation to the sign.

Instead of lamenting this observation about the human condition, I am seeking to make it one of the operational principles driving the creation of my techno-poetic work of art: thus, I enable the positive, constructivist, experiential examination of mutable context. Central to my thought is the observation of emergent meaning as conveyed through contexts generated by the use of a specifically authored techno-poetic mechanism. My system enables the construction of varying sign-configurations, as drawn from an initial collection of media-elements. Saussure points to the mutable paradoxical nature of the linguistic sign:

Mutability:

Time, which insures the continuity of language, wields another influence apparently contradictory to the first: the more or less rapid change of linguistic signs. In a certain sense, therefore, we can speak of both the immutability and the mutability of the sign.

In the last analysis, these two facts are interdependent: the sign is exposed to alteration because it perpetuates itself. What predominates in all change is the persistence of the old substance; disregard for the past is only relative. That is why the principle of change is based on the principle of continuity. (Saussure, 1959, p.74)

Where Saussure is primarily talking about linguistic signs, we can also apply this thought to non-linguistic signs as explored within a relativistic, time-based, mutable space. The environmental context of the techno-poetic mechanism, one assembled from a multiplicity of signs as well as non-sign states, is always under construction by the participant, who is working intimately within the constraints of the device. The produced environment is only ever fixed temporarily. A definition of emergent meaning characterised within this computer-based environment is subject to its own experiential emergent becoming. This sounds dangerously circular. In actuality this points to the nature of emergent experience. To again invoke Peirce: "The meaning of a representation can be nothing but a representation." (Peirce, 1931, p.171). Computer-based environments enable us to explore and manipulate representations in numerous ways. My techno-poetic mechanism is an authored environment where the manipulation of signs as well as the outcome of their recombination and use in the environment, can be observed. I will later discuss the difference between my exploration of media-elements and Wittgenstein's notion, "the meaning of the word is its use in language." (Wittgenstein, 1958, p.20)

Umberto Eco speaks of the importance of Peirce's definition of the sign in terms of intentionality:

As will be seen, a sign can stand for something else to somebody only because this "standing-for" relation is mediated by an interpretant. (which was another sign translating and explaining the first one and so on *ad infinitum*) as a psychological event in the mind of the possible interpreter; I only maintain that it is possible to interpret Peirce's definition in a non-anthropomorphic way. It is true that the same interpretation could also fit Saussure's proposal; but Peirce's definition offers us something more. It does not demand, as part of the sign's definition, the qualities of being intentionally emitted and artificially produced.

The Peircean triad can also be applied to phenomena that do not have a human emitter, provided that they do have a human receiver, such being the case with meteorological symptoms or any other sort of index. (Eco, 1979, pp.15-16)

In terms of my computer-based work, the configuration of signs which get generated through the running of the software, emitted as part of a generative interactive computer-based mechanism, is not directly emitted by a human. It is a complex interplay of inter-authorship between human and machine and participant ending in the generation of a specific virtual environment.

In the book *Understanding Computers and Cognition* by Terry Winograd and Fernando Flores, the authors talk about problems surrounding a fixed definition of "meaning":

There are two levels at which to define the problem. First, there is the problem of "semantic correspondence." Just what is the relationship between a sentence (or a word) and the objects, properties and relations we observe in the world? Few philosophers adhere to the naive view that one can assume the presence of an objective reality in which objects and their properties are "simply there." They recognize deep ontological problems in deciding just what constitutes a distinct object or in what sense a relation or event "exists." Some limited aspects (such as the reference of proper names) have been studied within the philosophy of language, but it is typically assumed that no formal answers can be given to the general problem of semantic correspondence.

The second, more tractable level at which to study meaning is to take for granted that some kind of correspondence exists, without making a commitment to its ontological grounding. Having done this, one can look at the relations among the meanings of different words, phrases and sentences, without having to answer the difficult question of just what those meanings are. (Winograd and Flores, 1986, p.18)

It is my intention to create a relativistic device enabling us to examine dynamic, unfixed relations between words and other media-elements in a computer-based experiential context. Emergent meaning, whose complexity is beyond the complexity of words to adequately elucidate, is individually understood through spatial and temporal experience as well as through words which attempt to approach, frame, and/ or point at it. Eugene Gendlin, in his text *Experiential Phenomenology* (Gendlin, 1973), also talks about the relation between words and the world:

Philosophy appeals beyond words to something that is not organised in a one to one relation to words and does not have units and relations that are the same as words and their logical relations. Linguistic analysis only looks like an analysis of language. What is actually analysed is something very different: namely, our "knowing how to use" words in situations.

This knowing how to use a word involves knowing all of the complexities of the situations governing use. It is possible to try to explicate what these are and linguistic analysts attempt this. But in so doing, they inevitably give this "knowing how" a verbal scheme which the "knowing how" is not. They verbally organize the maze of situational detail in just certain ways, even while asserting that action-in-situations cannot be so organized. We can see this clearly in the way in which linguistic analysts differ among themselves as to when such an explication has been achieved. (Gendlin, 1973, p.284)

This problem of organisation and the inclusion of alternative examples of "use" is one that cannot be overcome. The infinite variety and the ongoing *emergent* nature of language in the world will always thwart any holistic attempt toward systematising all instances of language use. This is particularly true of poetic language, where contemporary artists often intentionally experiment with use and in particular, with the bounds of meaning.

I have set out to make a poetic "instance" generator. There will always be a bias to how one goes about studying something. This metaphorically invokes the Heisenberg Uncertainty Principle, (Heisenberg, 1930) In short, the nature of our observation always relates in a dynamic manner to the nature of our perception as well as to the approach we have chosen to adopt, in order to frame the chosen subject. Gendlin observes the following:

Even if we accept the fact that, although these philosophers set themselves the task of getting at experience rather than imposing a scheme on it, they end by imposing a scheme after all, we can still ask: Did they involve the not-yet-verbalized in some way? did they impose a scheme, or did they use their sense of "knowing how"? surely, not only in the form of the scheme and not only after they state it. Surely, they will tell us how they have this "knowing how" and use it to make their explication. (Gendlin, 1973, pp.284-285)

I have made a generative frame in which one can observe a particular set of the "complexities of the situations governing use," (Gendlin, 1973, p.284) as related to exploration of particular media-elements in an authored and inter-authored virtual environment. Instead of trying to hide my bias, I have heightened it. I am an artist exploring particular aspects of emergent meaning through a work of art. I have authored the environment with the potential of exploring "poetic" use. It could be argued that this heightened bias distorts "situations of use;" on the contrary, any emergent poetic "use" is "use" nonetheless. The recombinant nature of the techno-poetic apparatus points *poetically* toward "non-closure" in terms of the potentials as well as the complexities of language use in general. This is accomplished from the emergent perspective of a non-fixed virtual environment.

The problematic of escaping the bias of a self-imposed scheme is, paradoxically, partially resolved in that my system enables emergence through the construction of variable contexts through interactivity, chance related processes and other generative means. My system is nevertheless limited by the scope of the media-elements I have loaded into it and by the functionality that the mechanism exhibits. Meaning here arises through a dynamic reaction to a series of computer-based environmental relations

between media-elements, media-processes and media-behaviours, over time. Meaning is always in a flux state, where thought is responding in an ongoing manner to subsequent information, experience and learning. The infinite variety of experience is not containable. It is only approachable through words which paradoxically sum it up, i.e., like the word infinite... as well as through subsequent experience itself.

I am not suggesting this flux is highly visible; on the contrary, the manifestation of difference (différance) (Derrida, 1976, p.23) can be extremely subtle in terms of the perception of change over time. That which the sign evokes is always subtly shifting, like erosion on the face of a rock, its physicality is changing, despite the appearance of permanence. Chaos theory (Gleick, 1996) attests to the subtle complexities that underlie palpable occurrences. This is also true of the complexity exhibited within the techno-poetic mechanism. Meaning is intimately tied to experience and memory in an ongoing manner.

It is this relative, tentative, unfixed quality of meaning that interests me. What subject is more elusive than the nature of meaning? Deleuze and Guattari describe this quality of unfixedity as a "flow" functioning as part of a larger conceptual assemblage in *A Thousand Plateaus* :

In a book, as in all things, there are lines of articulation or segmentarity, strata and territories; but also lines of flight, movements of deterritorialization and destratification. Comparative rates of flow on these lines produce phenomena of relative slowness and viscosity, or, on the contrary, of acceleration and rupture. All this, lines and measurable speeds, constitutes an assemblage. (Deleuze and Guattari, 1987, p.4)

The techno-poetic apparatus I have created in conjunction with this textual dissertation functions as the literalising of an "assemblage" of flows. It seeks to map in a diagrammatic manner — through visualisations and sonicisations generated through authorship, inter-authorship and interactivity — the transitory nature of particular perceptual qualities surrounding its own functionality. This environment points toward the fleeting nature of emergent meaning in circumstances of continuous "deterritorialization," through the exploration of an authored series of media-elements and through media-processes that are examined within an emergent context. The functionality of this art work, its quality of non-closure, manifests an ongoing "plateau" of change. Deleuze and Guattari speak about the origin of their use of the term "plateau":

A plateau is always in the middle, not at the beginning or the end. A rhizome is made of plateaus. Gregory Bateson uses the word "plateau" to designate something very special: a continuous, self-vibrating region of intensities whose

development avoids any orientation toward a culmination point or external end.
(Deleuze and Guattari, 1987, p.22)

My techno-poetic project is a literal and metaphorical example of a "plateau" space, and, in fact I will subsequently refer to the plane whereon the media-elements can be operated upon within my techno-poetic mechanism as the *plateau*. When the *vuser* is engaged by this techno-poetic mechanism, she/he enters into an ongoing process. Wherever the *vuser* enters, they always enter somewhere in the "middle." The *vuser* may leave the mechanism but the production of meaning has by no means ended; it is just temporarily suspended, shifting from direct engagement to subsequent memory processes and future experience.

The techno-poetic device exhibits non-closure. This fact aligns itself with the definition of the rhizome (Deleuze and Guattari, 1987, p.21) stated above. It is a "self-vibrating region of intensities." It is paradoxical, in that it can function as a means of discourse; although in itself, as an art work, it can also become an example of "purposeful purposelessness" as described by John Cage. "The highest purpose is to have no purpose at all. This puts one in accord with nature in her manner of operation." (Cage, 1967, p.155) The purposeful, mindfully aware engagement coexists with the potential of approaching the work as an environment of play. It is the mind-set of the *vuser* which enables varying levels of approach to the work. Emergent meaning is a by-product of this sophisticated play and/or mindfully aware observation. I will elaborate on the relevance of play in a subsequent chapter.

Meaning is evoked in many ways through multiple vehicles of conveyance. An opera conveys meaning in a different way to the meaning in a painting, a text, a photograph, a film, a sculpture, an installation, a gesture, a building, a dance, a computer-based work of art. My techno-poetic mechanism enables the conveyance of meaning as a product of interaction within a dynamic, behaviourally open, rhizomatic environment of layered meaning *milieus*.

1 See Thomas S. Kuhn — *The Structure of Scientific Revolutions* (Kuhn, 1970).

2 I will speak at length about the concept of "Re-embodied Intelligence" and "Inter-authorship" in a subsequent chapter as it relates to emergent meaning.

3 See also *Teletheory* (Ulmer, 1989, p.141); "What the tree diagram was to the book, the rhizome map is to electronics."

4 This quote by Baudrillard is referencing Borges' *Labyrinths*. (Borges, 1962)

1.1.4 *The Open Work and Works In Movement*

Umberto Eco in the early 1960s looked carefully at the potentials of the participation of the viewer with diverse works of art. He provides the definition of the "open work."

To avoid any confusion in terminology, it is important to specify here the definition of the "open work," despite its relevance in formulating a fresh dialectics between the work of art and its performer, still requires to be separated from other conventional applications of the term. Aesthetic theorists, for example, often have recourse to the notion of "completeness" and "openness" in connection with a given work of art. These two expressions refer to a standard situation of which we are all aware in our reception of a work of art: we see it as the end product of an author's effort to arrange a sequence of communicative effects in such a way that each individual addressee can refashion the original composition devised by the author. The addressee is bound to enter into an interplay of stimulus and response which depends on the unique capacity for sensitive reception of the piece. In this sense the author presents a finished product with the intention that the particular composition should be appreciated and received in the same form as he devised it. As he reacts to the play of the stimuli and his own response to their patterning the addressee is bound to supply his own existential credentials, the sense of conditioning which is peculiarly his own, a defined culture, a set of tastes, personal inclinations and prejudices. Thus his comprehension of the original artifact is always modified by his particular and individual perspective. In fact, the form of the work of art gains its aesthetic validity precisely in proportion to the number of different perspectives from which it can be viewed and understood.

A work of art is a complete and closed form in its uniqueness as a balanced organic whole, while at the same time constituting an open product on account of its susceptibility to countless different interpretations which do not impinge on unadulterable specificity. Hence every reception of a work of art is an interpretation and a performance of it, because in every reception the work takes on a fresh perspective for itself.

Nonetheless, it is obvious that works of those like those of Berio and Stockhausen are "open" in a far more tangible sense. In primitive terms we can say that they are quite literally "unfinished": the author seems to hand them on to the performer more or less like the components of a construction kit. (Eco, 1989, pp.3-4)

The performative aspect of interpretation is heightened within my computer-based interactive work. The notion of an automated "construction kit," housing specific media-elements, is central to my system. Unlike the music works which Eco describes, my techno-poetic mechanism presents an operative mechanism which both houses and enables access to specific media-elements as well as the means to navigate, to construct with and to explore those elements. Eco suggests that the contemporary artist seeks to examine states of "openness," "In fact, rather than submit to the 'openness' as an inescapable element of artistic interpretation, he subsumes it into a positive act of the production, recasting the work so as to expose it to the maximum possible 'opening.' " (Eco, 1989, p.5)

Eco's observations in the *Open Work* are directly relevant to the emergent field of recombinant poetics and to the authorship of my techno-poetic device. In a nutshell, this is an explanation for the fact that my techno-poetic work exhibits non-closure, presenting a virtual situation which is "more or less like the components of a construction kit." (Eco, 1989, p.4) He goes on to talk about how this kind of situation stimulates a viewer to respond and become interactive with the environment. In a section entitled "Transaction and Openness" Eco presents a comment about "our natural craving for completion":

Let us first examine how art in general depends on deliberately provoking incomplete experiences — that is, how art deliberately frustrates our expectations in order to arouse our natural craving for completion.

Leonard Meyer has provided us with a satisfactory analysis of the psychological mechanism in his book *Emotion and Meaning in Music*, where he uses Gestalt premises to build an argument concerning the reciprocal relationship between objective musical structures and our patterns of reaction- that is how a message conveys a certain amount of information which however, acquires its value only in relation to the receiver's response and only then organizes itself into meaning. (Eco, 1989, p.74)

In order to construct a techno-poetic mechanism to explore the nature of emergent meaning, one could possibly enhance this "natural craving for completion" in inventing an *Engine of Desire*. My mechanism enables the generation of varying "Gestalts,"¹ or environmental constellations of media-elements, to facilitate the direct examination of aspects of emergent meaning within an engaging, interactive environment.

It is the poetics of this situation that drives the desire to construct my device — a poetics of emergent meaning. This *Engine of Desire*² propagates a dynamic relation between artist and *vuser* as it manifests interaction through desire processes. I am not here suggesting that this mechanism posits the perspective of all potential desire processes; indeed this would have to be a pluralistic device. We can not escape our varying predilections. However, the techno-poetic mechanism enables us to register our own individual responses to particular choices presented within the environment, in that the outcome of the experience is predicated on our selections.

Eco outlines a form of art work he calls "works in movement." These works place a responsibility on the participant through engaged interaction. Eco, in speaking about the musical work *Scambi*, by Pousseur, suggests that:

The auditor is required to do some of the organizing and structuring of the musical discourse. He collaborates with the composer in making the composition. (Eco, 1989, p.12)

Eco later continues:

It is clear that a composition such as *Scambi* poses a completely new problem. It invites us to identify inside the category of "open" works a further, more restricted classification of works which can be defined as "works in movement," because they characteristically consist of unplanned or physically incomplete structural units. (Eco, 1989, p.12)

Eco speaks about a musical work having a specific mutable, incomplete structural nature, and goes on to mention other forms, i.e., Mallarmé's unfinished *Livre* which was conceived of as a literary "mobile apparatus." (Eco, 1989, p.13) I am concerned with a contemporary extension of this exploration of malleable "incomplete structural units," in that the participant takes an active role in the structural composition of the environment and in the determining what the work conveys. This dynamic relation centres around qualities and levels of inter-authorship, making contemporary and operative many ideas that have previously been expounded pertaining to music and text.

Roland Barthes has also suggested related ideas in terms of texts.³ Barthes spoke of a form of "perceptual interweaving" of elements and processes — although the level and quality of the engagement with subject was not at that time focusing on the overtly operational and interactive, as found in computer-based interactive art works. Barthes reflects on this notion:

Text means tissue; but whereas hitherto we have always taken this tissue as a product, a ready made veil, behind which lies, more or less hidden, meaning (truth), we are now emphasizing in the tissue, the generative idea that the text is made, is worked out in perceptual interweaving. (Barthes, 1975, p.64)

The engagement of the *vuser* is potentially heightened in an interactive techno-poetic environment. It's possible that there is a qualitatively different engagement with words alone when compared to the exploration of diverse media-elements exhibited and explored through technological means. Eco later speaks about the ramifications of works of art enabling this dynamic:

Certainly this new receptive mode vis-à-vis the work of art opens up a much vaster phase in culture and in this sense is not intellectually confined to the problems of aesthetics. The poetics of the "work in movement" (and partly that of the "open" work) sets in motion a new cycle of relations between the artist and his audience, a new mechanics of aesthetic perception, a different status for the artistic product in contemporary society. It opens a new page in sociology and in pedagogy, as well as a new chapter in the history of art. It poses new practical problems by organising new communicative situations. In short, it

installs a new relationship between the *contemplation* and the *utilization* of a work of art. (Eco, 1989, p.23)

Instead of using only words to explore emergent meaning through generative mechanisms in the techno-poetic device, I seek to create a means to point toward the complexities and on-going definition of emergent meaning; to enable experiential examination of shifting, complex, emergent media-relations in terms of particular contextual aspects of meaning arising within a continuously inter-authored mutable environment.

1 It must be noted that the concept of the Gestalt has more recently been questioned. Aumont in *The Image* states:

The Gestaltist explanation is no longer valid (it consisted in attributing the perceived organisation to the impact of the elements of the stimulus on force fields of the nervous system, conceived rather like an electrical field), but the observations which gave rise to the explanation remain relevant... For several decades, attempts to move beyond the theory of form have largely centered on the concept of information, in the technical sense of the term as used in the well-known theories of Claude E. Shannon and Warren Weaver... The notion of information enables Gestaltist principles to be rewritten in a more general way, incorporating them into the minimum principle: among two possible informational organisations of a given figure, it is the simplest that will be perceived, the one which contains the most redundancy or, which amounts to the same thing, the one which mobilises the least information. (Aumont, 1997, pp.48-49)

2 The title of the techno-poetic mechanism is *The World Generator/The Engine of Desire*.

3 It must be noted that I draw relevance from various authors and apply it to this project. It is obvious that Barthes lived in a very different time and his ideological concerns may have been unlike other authors that I will cite in this text. I feel that it is important to point toward a diverse selection of contributions from various authors to form a pluralistic set of perspectives. My work may be informed by an aspect of their individual practices and still not fully reflect their ideological concerns.

1.1.5 A Conflation of Language-Vehicles

As stated earlier, the techno-poetic mechanism explores a conflation of language-vehicles in the pursuit of the production and examination of emergent meaning. J.R. Firth presents the following views on contextual meaning in linguistics:

The contextual theory of meaning employs abstractions which enable us to handle language in the interrelated processes of personal and social life in the flux of events. As I emphasised in my little book [*Speech*, Chapter 5, emphasis Seaman] published over twenty years ago, "In common conversation about people and things present to the senses, the most important 'modifiers' and 'qualifiers' of the speech sounds made and heard, are not words at all, but the perceived context of the situation. In other words 'meaning' is a property of the mutually relevant people, things, events in the situation." (Palmer, 1968, p.14)

The techno-poetic virtual environment that I am entertaining does not present spoken or written text in a hierarchy above the "mutually relevant people, things, events in the situation presented." I see each computer-based media-element, media-process and media-behaviour, as well as any interactant (a person who interacts), involved in a

dynamic situation of modification and qualification, in that each of these elements and participants exhibits a field of meaning force. Meaning is evoked through the dynamic time-based environmental summing up of those enfolded forces as perceived by the *vuser* and/or an external observer — a summing up of cyber-polysemic forces. This configuration may form a Gestalt. Aumont, in *The Image* states:

At the beginning of the twentieth century, emphasis was put by the theoreticians of form on the innate capacity of the brain to organise the visual according to universal and unchanging laws. This was the so-called Gestalt theory. From 1950 onwards, following the work of J. J. Gibson and others, this approach has once again entered circulation, first under the guise of psychophysiology and then as ecological theory of visual perception. (Aumont, 1997, p.34)

The question becomes, how does this configuration function in terms of our understanding of language? Here Christian Metz is of importance. In his book *Film Language, A Semiotics of the Cinema*, Metz speaks extensively about film in terms of language relations:

Born of a fusion of several pre-existing forms of expression, which retain some of their own laws (image, speech, music and noise), the cinema was immediately obliged to compose, in every sense of the word. From the very beginning, threatened with extinction, it became an art. Its strength or its weakness, is that it encompasses earlier modes of expression: Some, truly languages (the verbal element) and some languages only more or less in the figurative sense (music, images, noise). (Metz, 1974a, p.58)

Metz is also presenting the notion of a conflation of differing "languages," in terms of cinematic art. Where Metz differs from my project is his insistence in observing film as related to a linguistic utterance instead of defining its communicative capacity on its own merits. In *Cinema 2*, Deleuze succinctly points out this problem:

The root of this difficulty is the assimilation of cinematographic image to an utterance. From that point on, this narrative utterance necessarily operates through resemblance or analogy and in as much as it proceeds through signs, these are 'analogical signs.' Semiology thus needs to have a double transformation: on the one hand the reduction of the image to an analogical sign belonging to the utterance; on the other hand the codification of these signs in order to discover the (non-analogical) linguistic structure underlying these utterances.

Deleuze continues:

But at the very point that the image is replaced by an utterance, the image is given a false appearance and its most authentically visible characteristic, movement, is taken away from it. (Deleuze, 1995, p.27)

The techno-poetic mechanism, in translating notions of the filmic to virtual space, extend the potentials of film into and across the digital domain. I do not want to define

the media-elements as textual utterances. Each operative element is an extension of its own semiotic milieu, functioning in juxtaposition and interpenetration with other milieus. Metz is particularly interested in the specificity of filmic discourse in terms of the image:

Nevertheless these "languages" are not found on the same plane with respect to the cinema: Speech, noise and music were annexed at a later time, but film was born with image discourse. A true definition of "cinematic specificity" can therefore only be made on two levels: that of filmic discourse and that of image discourse. (Metz, 1974a, p.58)

The spatial complexity of my project nests digital video as one media-element in a complex configuration of media elements. I am taking what Metz calls an "erector set" approach to the construction of the virtual space, enabling a non-hierarchical relevance relation to these media-elements of image, text, music and sound. Metz speaks extensively about Eisenstein, montage, [see the chapter entitled "Eisenstein: Montage"] and his particular "erector set" approach to meaning. (Metz, 1974a) In the techno-poetic mechanism, I am specifically exploring new forms of spatial montage. These are not constructed by splicing one element after another in a filmic chain. The montage is produced through *vuser* construction and navigation, building a time-based trajectory of relations based on proximity and virtual passage, while also defining a virtual spatial syntax.

Although I am not applying Metz's exploration of the utterance in terms of my employment of media elements, it is interesting to note that in some ways Metz pre-defines a "cybernetic" proposition that has many similarities to my own project. He states:

THE SPIRIT OF MANIPULATION. A comparison suggests itself — and deserves more attention than the brief remarks that follow — between the obsession with breakdown analysis and montage and certain tendencies of the "modern" spirit and civilisation. In its moments of excess, when inspiration would desert it, montage cinema (other than Eisenstein's films) came at times close to being a kind of mechanical toy to captivate our children, who acquire a taste for manipulation in their playing, which if they later become engineers, specialists in cybernetics, even ethnographers and linguists, may be extended into a whole operational attitude, whose excellence of principle will be more evident here than in film. (Metz, 1974a, p.34)

Metz, is describing the age of the recombinant sign. And yes, play is central to the techno-poetic mechanism, as are operational "analysis" and new forms of spatial "montage." It is also here that we have another conflation, not only the conflation of "languages" but also a conflation of attitudes, combining seriousness and play, sense and nonsense. Metz continues describing this cybernetic approach:

The machine has ground up human language and dispenses it in clean slices, to which no flesh clings. Those "binary digits," perfect segments, have only to be assembled (programmed) in the requisite order. The code triumphs and attains its perfection in the transmission of the message. It is a great feast for the syntagmatic mentality. (Metz, 1974a, p.35)

We are now at a technological stage which builds on these first concepts of cybernetic manipulation, a stage where interactivity comes to the fore. The modularity of this system is not in "clean slices," but in elegantly authored variables that can be intermingled through human interaction. It is by all means a "feast for the syntagmatic mentality," "where syntagmatic relations are those which exist among the actual (or 'present') elements of a statement." (Metz, 1974a, p.x) Virtual reality presents a new form of navigable statement and operative space, a recombinant poetic interpenetration of volumetric fields (groups of pixels) that can be entertained through interaction, enabling a original kind of emergent experience. Metz continues:

What Eisenstein wanted to do, what he dreamed of perpetually, was to make the lesson of events visually apparent and through breakdown analysis and montage to make itself an appreciable event. (Metz, 1974a, p.36)

This concept is central to the potential operative conflation of language-vehicles. I am seeking to generate an environment that can make the "lesson of events visually apparent" and simultaneously poetically evocative, to enable the exploration of emergent meaning in a meta-operative manner, as a new form or vehicle of analysis — a recombinant poetic form:

How far can the taste for manipulation go, one of the three forms of what Roland Barthes calls "sign imagination" (*l'imagination du signe*) go? Does not Moles¹ anticipate a "permutational art" in which poetry, discarding the chaste mystery of imagination, will openly reveal the portion of manipulation it has always contained and will finally address itself to computers? The "poet" would program the machine; the machine would then explore all the possible combinations and the author would, at the end of the process, make his selection. (Metz, 1974a, p.37)

The techno-poetic mechanism can be triggered to explore this notion of permutation [see the chapter on "Re-Embodied Intelligence"] building entire virtual worlds at the touch of a button. This process is just one process nested in a complex environment of subtle interactions. Interaction of this kind presents an activity that thoroughly engages the imagination. In fact the *vuser* inter-authors her/his experience. Metz, here, inverts the negative, questioning of Moles regarding this computer-based practice, expressing the importance of this methodology:

A utopia? Or prophecy? Moles does not say it will come tomorrow and there is no reason why one can not extrapolate from the premises today... This essay springs from the conviction that "montage or bust" approach is not a fruitful

path for film (nor, for that matter, poetry). But it should be seen that that orientation is entirely consistent with a certain spirit of modernism, which, when called cybernetics or structural science, yields results that are much less questionable. (Metz, 1974, p.38)

In the period when a certain form of intellect agent becomes more aware and sure of itself, it is natural that it should tend to abandon areas, such as the cinema, that restricted it and should gather its forces elsewhere. (Metz, 1974a, pp.38-39)

Metz makes explicit the potentials for this mechanism, through "a certain form of intellect agent." This device explores emergent syntagmatic relations through the conflation of "language" elements (or language-vehicles as I have chosen to call them), as occurs within a "cybernetic" environment. It is now often the case, in terms of computer-based content, that an entire setting of media-relations, a constellation of signs and non-sign states, must be examined before meanings can be gleaned.

We easily accept the notion of the transmission of meaning without words from the perspective of the arts; a dynamic relation exists between words and the world. In the book *Meaning Without Words*, Peter Gilroy points to our initial engagement with the learning of language — how we move from the non-verbal to the verbal. In the conclusion he writes:

Given the mutual entailments operating between philosophy of language, meaning theory and first-language acquisition then, as both the second and third subject areas have been shown to require the addition of the non-verbal aspect of meaning, the philosophy of language has effectively been translated into the "philosophy" of them both, the verbal and the non-verbal. By doing so a new area of philosophical inquiry has been identified, the philosophy of communication theory. In enlarging the scope of the philosophy of language in this way I have attempted to identify contexts where meaning can be expressed utilising the varieties of non-verbal communication. At this point the descriptivist philosopher and the functional linguist merge to become social anthropologists, studying the nature of the phenomenon of communication from its potential beginnings in simple non-verbal behaviour through to its actualisation in the complexities of that behaviour we call language, where there is meaning with and without words. (Gilroy, 1996, p.173)

It is the intellectual extension of the dynamic relation between words, alternate media-elements, media-behaviours, human behaviours and environmental factors, as engaged within a specific generative computer-based space, that is central to my project. The simultaneous inter-conveyance of various media-elements of spoken and written language, the language-vehicles of both still and time-based images and sonic language-vehicles, functioning as a unified field of suggestion, that evokes meaning. Historically, this is characteristic of installation-based art works, where a combined set

of non-computer-based objects, images, texts, sounds, music and/or media-elements are brought together in for artistic expression and/or non-logocentric expression.

I am now seeking a virtualisation and abstraction of the art-installation. How can we begin to accurately reflect upon this complex environment? Should we develop a method of examination of meaning to be explored in terms of environmental relations that arise as a result of interaction with differing media-elements — a "philosophy of communication theory" as it pertains to mixed-semiotic environments? In particular, should we begin to examine computer-based environmental meaning? Unfortunately, the development of a theory of computer-based environmental meaning, pertaining to generative virtual environments, is outside of the scope of this project. However, I will offer an initial means of approaching the question by developing notions surrounding the concept of fields of meaning.

Kittler's concept of *Discourse Networks* (Kittler, 1990) is relevant here, in particular how the typewriter as a technology altered the nature of discourse and language. In the forward to *Discourse Networks*, David E. Wellbery sums up Kittler's approach:

In short, the modernist discourse network unravels language, reduces its wholeness and centeredness to a tangle of nervous, sensory-motor threads, to a scatter of differential marks. The precondition of this unweaving is the minimal experimental condition of psychophysics: that writing, as writing, be written down. In order for this detachment of writing from subjectivity to occur, however, inscription had to become mechanized and this happens with the typewriter. The typewriter, Heidegger noted, alters our relationship to being: it takes language away from the hand, which-and here Heidegger is faithful, as so often, to Aristotle-distinguishes "man." Kittler, without sharing the philosopher's nostalgia, renders this Heideggerian intuition historically concrete. The typewriter frees writing from the control of the eye and of consciousness; it institutes spacing as the precondition of differentiation; it stores a reservoir of signifiers that strike the page much as Ebbinghaus's syllables strike the body's sensory surface. Nietzsche's notion of moral inscription is modelled on the typewriter, one of the earliest versions of which he owned and used. Saussure's linguistics, in Derrida's reading a linguistics of arche-writing, has its technological correlate in the typewriter. Freud's psychic apparatus, as he called it, is a writing machine. Moreover, as Kittler shows, the literacy production of the era is no less dependent, in conception and practice, on the new technology of the letter. Mallarmé calls for the disappearance of the elocutionary subject and derives poetry from the 26 letters of the alphabet and the spaces between them. (Kittler, 1990, p.xxxi in the Foreward)

I do not agree with all of the notions presented above, i.e. I do not believe that "The typewriter frees writing from the control of the eye and of consciousness." Although, we can extrapolate some of the ideas presented; the computer does further alter "one's relationship to being," through exploring an entirely different notion of "spacing" — that of virtual space. The device "stores a reservoir of signifiers," and on different order

to that of the alphabet, presents experiential material that strikes "the body's sensory surface," and enables a move away from the exploration of combinatory alphabetical elements to the exploration of recombinant media-elements. Interaction promotes engagement through activated consciousness. Meaning is that which the sign conveys, to paraphrase Peirce (Peirce, 1931, p.171) Kittler, in *Discourse Networks*, points to the notion that the technological user is shaped by the technology. There is, of course, a dynamic relation created between being in the world and experiencing technological inventions. As an artist, I tend to take a more balanced view, seeing technology as being both beneficial and problematic. I see the techno-poetic device as an authored, empowering technology.

The media-theorist Tim Druckrey articulates the need to formulate a new theory of representation which could play an important role in terms of future discourse related to virtual reality:

Interactive work will also require a reassessment of the relationship linking experience and discourse. If images are to become increasingly experiential, then a theory of representation must be evolved to account for the transaction provoked by participation. (Druckrey, 1993, p.28)

The techno-poetic mechanism is an initial gesture in this direction. I have sought to construct an operative computer-based environment, where the environment could be easily altered in order to observe shifts in meaning over time. This space of unfixity, as related to varying media-elements, has been made operative and interactive, functioning to illuminate aspects of the relationship between "experience and discourse."

1 See A. Moles, Poésie expérimentale, poétique et art permutatif, in *Arguments*, no. 27 & 28, pp.93-97.

1.1.6 Fields of Meaning — An Emergent Approach to the Perception of Context

To best pursue a theory of experiential representation, I have chosen to focus on the concept of *fields of meaning*. Derrida in *Writing and Difference [Différance]* (Derrida, 1976, p.23) [note - "Difference" is how the translator has rendered the term "Différance," emphasis Seaman] from numerous perspectives, how meaning can only arise through qualities of difference (différance). The term "différance" is a pun in French, simultaneously pointing to difference and to *deference* or to put off until later. I will now take this notion of difference and expand it through another pun, one that points to the first computer and the exploration of computational "difference" in an operative manner. My techno-poetic art work is a contemporary

"difference"["différance"] engine (Babbage, 1961) that enables a non-logocentric spatial approach to emergent meaning through computing. In *Writing and Difference* (*Différance*) Derrida speaks about force and "a certain pure and infinite equivocality:"

But is it by chance that the book is, first and foremost, volume? And that the meaning of meaning (in the general sense of meaning and not in the sense of the signalization) is infinite implication, the indefinite referral of signifier to signifier? And that its force is a certain pure and infinite equivocality which gives signified meaning no respite, no rest, but engages it in its own economy so that it always signifies again and differs? (Derrida, 1978, p.25)

It is certainly this very nature of language that I am exploring through my techno-poetic "difference"["différance"] (Derrida, 1976, p.23) engine. In this form of spatial environment, or authored virtual "volume," there is a play of forces, each contributing in a subtle way to the nature of how meaning arises in the mind of the vuser. Derrida points to the complexity of these forces which extend far beyond simple binary relations:

Our intention here is not through the simple motions of balancing, equilibration or overturning, to oppose duration to space, quality to quantity, force to form, the depth of meaning or value to the surface of figures. Quite to the contrary. To counter this simple alternative, to counter the simple choice of one of the terms or one of the series against the other, we maintain that it is necessary to seek new concepts and new models, an economy escaping this system of metaphysical oppositions. The differences examined simultaneously would be differences of site and differences of force. If we appear to oppose one series to the other, it is because from within the classical system we wish to make apparent the noncritical privileged naively granted to the other series by a certain structuralism. Our discourse irreducibly belongs to the system of metaphysical oppositions. The break with this structure of belonging can be announced only through a certain organization, a certain strategic arrangement which, within the field of metaphysical opposition, uses the strengths of the field to turn its own stratagems against it, producing a force of dislocation that spreads itself throughout the entire system, fissuring in every direction and thoroughly delimiting it. (Derrida, 1978 p.20)

The techno-poetic mechanism enables a specific play of forces, literalising, visualising and making operative Derrida's notion of meaning "force." The techno-poetic mechanism is an engine of location, dislocation and re-location. An engine of spatio-temporal simultaneity. It is the operational nature of this device, a "fissuring" and fusing engine, that enables us to explore emergent meaning. This meaning arises at the demise of any singular fixed meaning. Saint-Martin, in *Semiotics of Visual Language*, posits this notion of difference from another perspective:

But this logical type of discontinuity does not affect the continuous / discontinuous spatial relationship which perceptive activity establishes at the level of topological relationship. Continuity appears here as a constructed intuition reorganizing the discontinuous aspects of material events. In the same

way, a spatial continuum is not a given datum but a construction of perception itself. (Saint-Martin, 1990, p.71)

One needs to seek a concept that can help to elucidate the dynamics of this space to discuss the engaging aspects of emergent environmental meaning as produced through a conflation of forces. The concept of the *field*, as borrowed from physics, becomes central to an emergent approach to the complexity of signification within my generative virtual environment. Umberto Eco in *The Open Work* speaks about the field:

Hence, it is not overambitious to detect in the poetics of the "open work"- and even less so in the "work in movement"- more or less specific overtones of trends in contemporary scientific thought. For example, it is a critical commonplace to refer to the spatiotemporal continuum in order to account for the structure of the universe in Joyce's work. Pousseur has offered a tentative definition of his musical work which involves the term "field of possibilities." In fact, this shows he is prepared to borrow two extremely revealing technical terms from contemporary culture. The notion of "field" is provided by physics and implies a revised vision of the classic relationship posited between cause and effect as a rigid, one-directional system; now a complex interplay of motive forces is envisaged, a configuration of possible events, a complete dynamism of structure. (Eco, 1989, p.14)

The techno-poetic mechanism exhibits a "complex interplay of motive forces." The dynamic play of multiple planes of forces of difference [différance], (Derrida, 1976, p.23) contribute to the perception of a perceived or evoked sum. Peirce says that the sign "stands *for* something *to* the idea which it produces, or modifies." (Peirce, 1931, p.171) It is here that I am specifically motivating and making operational, the function of modification.

In terms of the visual field Saint-Martin, in *Semiotics of Visual Language*, speaks about relations between colorememes, where a colorememe is defined as:

A zone of the visual linguistic field correlated to a centration of the eyes. It is constituted by a mass of energetic matter presenting a given set of variables. This primary element of visual language is made up, from a semiotic point of view, of a cluster of visual variables... (Saint-Martin, 1990, p.5)

He goes on to say:

The colorememe is immediately structured as a topological region. Visual perception is realized through a positioning of the eye in the direction of the visual field, called an ocular centration or fixation... Given the richer visual potentialities of the two central sources of vision, we have defined as a colorememe the area of the visual field which is the product of two interrelated zones: (1) a central area more precise, dense and compact, corresponding to foveal vision; and (2) some peripheral layers, less dense, but still rich in colors, corresponding to macular vision.

On the objective plane of representation, the colorem corresponds to any colored quality located at the termination point of an ocular fixation and contributing to the formation of a visual percept. The very definition of the percept as an entity structured as a field of forces (Gurvitsch, 1957, p.114) requires that the minimal unit by semiotics to a visual language be a material zone sufficiently large for perceptual mechanisms to be realized. (Saint-Martin, 1990, p.6)

Thus, we shift from the force of the word to alternate visual forces. Saint-Martin attributes this notion of forces to Gurvitsch from his *Théorie Du Champ de la Conscience*, (Gurvitsch, 1957) where the "percept" arises out of a "field of forces." My generative virtual environment enables the dynamic arising of juxtapositions or neighbourings of colormes. It also enables the interpretation of alternate colormes to form the perception of emergent colormes. Saint-Martin further examines relations between this approach as it relates to the "phonetic unit of verbal language:"

This definition of the element of visual language as a continuous and spatialized topological entity, endowed with somewhat fuzzy boundaries, would appear incompatible with the accepted view of the phonetic unit of verbal language, only if one neglected to consider the actual elasticity of this latter notion. In effect, the phoneme is constituted by a cluster of auditory variables within extended limits and it can also, according to the individual case, play the role of a morpheme or even of an entire phrase. (Saint-Martin, 1990, p.7)

The techno-poetic mechanism seeks to explore and make palpable this "elastic" nature of both visual and textual language. Saint-Martin goes on to specifically elucidate the field-like quality of visual perception and the notion of meaning force:

One should be constantly aware that abstract considerations relating to the nature of the visual variables can be misleading, as none can exist independently of the others and none can be apprehended in an identical way in two places of the visual text or at different moments. As each colorem by necessity, regroups the totality of a set of visual variables, any process of junction/disjunction in visual language is a dialectic equilibrium realized between two or several colormes and not between different aspects of a unique visual variable. (Saint-Martin, 1990, p.9)

Thus, the notion of the summing of forces (at this moment focusing on the nature of visual forces) becomes central to the production of meaning and moves away from examining language from the perspective of individual signifying units toward a perception of dynamic perceptual energy processes. Saint-Martin states:

Considering the agglomerates of matter which constitute the semiotic carrier of visual language, visual semiotics has every reason to abandon previous paths and to adopt an epistemology which is more in agreement with the dynamisms of observed phenomena. it will recognize that matter is not inertness, but energy. As Bachelard expresses it:

It is energy which becomes the fundamental ontological notion of any modern doctrine of matter, even the principle of individualization of material substances. Any atomistic philosophy must, because of this fact, be reformed. One must decide whether the real has a structure in relation to its qualities or whether it produces dynamic phenomena as a result of its structure [(Bachelard, 1951, p.135) as found in (Saint Martin, 1990, p.4), emphasis Seaman]

...In a certain sense, the basic element of visual language can only be a psychophysical entity defined by both the subjective and objective aspects of a percept. (Saint Martin, 1990, p.4)

Thus, the techno-poetic mechanism seeks to approach a virtual world of energy processes, exploring both the "subjective and objective aspects of the percept." Along these lines, in a paper entitled "Toward A Field Theory for Post-Modern Art," Roy Ascott has outlined an approach to meaning in the arts. In it he discusses the potentials of a specific behavioural mode of psychic interplay as a particular generative methodology:

I would like to look at the attributes for a new paradigm for art, a field theory that would replace the formalist modernist aesthetic. It takes as a focus not form but behaviour; not an information model for sending/receiving of messages in a one-way linearity but the interrogation of probabilities by the viewer; it looks at a system in which the art work is a matrix between two sets of behaviours (the artist and the observer) providing for a field of psychic interplay which can be generative of multiple meanings, where the final responsibility for meaning lies with the viewer. (Ascott, 1980, pp.51-52)

The notion that meaning is contingent on context and that context can be generated through viewer interaction is central to the functionality of the techno-poetic mechanism. This device can act as a conduit of exchange between the author of a generative media-world and a vuser, further co-authoring an emergent space. Interaction promotes an engagement with an environment populated with media-elements: recombinant music/sound, spatial text, juxtapositions of computer-graphic objects, images, digital movies, as well as attached *behaviours*, all functioning as relative fields of meaning force. These fields act upon one another and form this recombinant cyber-polysemic field of fields.

One person who articulated the concept of the field as related to meaning is Andrew Paul Ushenko in *The Field Theory of Meaning* :

I. Physical and Phenomenological Fields.

A physical vector field is an expanse, or spread, of tension, each region of which acts on an appropriate material test body with a definite strength and in a definite direction. An acting field force is a vector because it has both a magnitude and a direction. If forces or vectors are distributed among different

regions of a field with different magnitudes or directions, the field as a whole exhibits a definite pattern of tension. (Ushenko, 1958, p.79)

Ushenko was dealing specifically with the charting of "sentences" through a form of physics-like vector analysis. In the preface to Ushenko's book, Stephen C. Pepper, observed the following:

Ushenko does not propose to find the meaning of a statement by considering the acts or beliefs of the author, but only by considering the references of the theoretically anonymous sentence itself... He points out that isolated words are ambiguous and become univocal and clearly informative only when they are embedded in sentences, when they are embedded in a field of meaning along with other words which mutually modify on another's potential ambiguities in a joint context. (Pepper in Ushenko, 1958, Preface)

Unlike Ushenko, I believe that the *vuser's* own mind-set can not be factored out of the meaning forces equation. Notions related to "fields of meaning" have been discussed by authors from different disciplines. I am interested in exploring this concept of the field within an environmental computer-based context. Each media-element potentially functions as a "field of meaning" and exhibits a form of force that influences the perception of other chosen media-elements during interaction. As stated earlier, the space is punningly negotiated as virtual experience. The user of the system also brings active participation to the reception of the environment. Again, this very relevant field — that of the *vuser's* mind-set — seems to be left out of Ushenko's approach. The mind-set of the *vuser* represents another field that comes into this "spread of tension." The reading or understanding of a recombinant poetic environment will be perceived by a *vuser* as the sum of the evocative "forces" exerted by the various media-elements brought into relative proximity. It must be noted that this environment is time-based and is not fixed; the sum of these "forces" is cumulative and transitory in nature.

Brian Massumi functioned as translator of the English edition to Deleuze and Guattari's *A Thousand Plateaus* and has subsequently written a *Users Guide* to the work. In it he makes the following observation:

Meaning is Force: This gives us a second approximation of what meaning is: more a meeting between forces than simply the forces behind the signs. Force against force, action upon action, the development of an envelopment: meaning is an encounter of lines of force, each of which is actually a complex of other forces. The processes taking place actually or potentially on all sides could be analyzed indefinitely in any direction. (Massumi, 1992, p.11)

In the techno-poetic mechanism, media-elements have been authored with an intentional polyvalent nature. An individual media-element may exhibit a set of divergent forces enfolded within one "modular media variable," arising in relation to alternate contexts of

juxtaposition that are brought about through interaction i.e., a pun has more than one evocation, contributing to an environment of "forces" moving simultaneously in differing directions. The complexity of the perception of these forces can potentially become problematic, especially when multiple media-elements — exhibiting a plurality of readings — are simultaneously explored in relation to one another. It is this complex space that alternately can lend to an engaging resonance to the work of art. Polyvalence can manifest an experience that is greater than the sum of its parts, depending on the media-collection employed. Media-elements become nodal and define a set of relations over a distance of virtual space and time; later becoming related to a series of alternate authored media-elements, which add to the connective nature of the environment. Multiple conceptual relations are brought about through recontextualisation.

Writing about emergent examples of virtual architecture in *An Evolutionary Architecture*, John Frazer describes another perspective on the employment of the notion of the "field." He states:

The idea of the field is not foreign to mainstream science, which uses the concept to explain gravitation, electromagnetism and other phenomena that can be perceived by their effect on matter, yet can not be explained in terms of matter. Field phenomena are exhibited in objects with holistic properties, such as a magnet or a hologram. A field is always whole. If a magnet is broken in two, each half will produce it's own magnetic field. If a hologram is shattered, each fragment will depict, not a shard of a three-dimensional image, but a complete two dimensional image. A field is mutually tied to the material in which it is manifested. The history of the form is the history of the field. Every type of material form in the universe, from subatomic particles to the universe itself, is conjectured by [Rupert] Sheldrake to have an associated field which guides its formation and maintains its structure. (Frazer, 1995, p.112)

It is this dimensional holistic quality of a virtual environment that separates it from many past poetic forms. Even a fragment of a media-element can contribute to the summing of a set of conveyances, as evoked within the configuration of conjoined fields. This environment is "always whole," and each "fragment" is both a whole in itself, as well as part of a larger whole. The fragment can easily lend an evocative force to this equation. The notion that the "history of the form is the history of the field" is central to the experience of my techno-poetic discourse mechanism. We can also trace notions of oneness and connectedness to a series of spiritual disciplines,¹ although a discussion of the spiritual ramification of the techno-poetic mechanism falls outside of this particular project.

N. Katherine Hayles has chosen to elucidate a notion of fields of meaning in her book *The Cosmic Web: Scientific Field Models and Literary Strategies in the Twentieth*

Century. Hayles approaches the use of "fields" as abstracted from physics, directly relating to those suggested by Ascott. She states:

The field concept, as I use the term, is not identical with any single field formulation in science. For the men and women who work with the various scientific field models from day to day, they have specific meanings and applications. The term "field concept," by contrast, draws from many different models those features that are isomorphic and hence that are characteristic of twentieth-century thought in general. The only way to approach a satisfactory understanding of the field concept is to examine and compare a wide range of phenomena that embody it... Perhaps most essential to the field concept is the notion that things are interconnected. The most rigorous formulations of this idea are found in modern physics. In marked contrast to the atomistic Newtonian idea of reality, in which physical objects are discrete and events capable of occurring independently of one another and the observer, a field view of reality pictures objects, events and the observer as belonging inextricably to the same field; the disposition of each, in this view, is influenced- sometimes dramatically, sometimes subtly, but in every instance — by the disposition of the others. (Hayles, 1984, Preface II)

The techno-poetic mechanism experientially enables the examination of the interpenetration of elements. These elements are "interconnected." They are simultaneously modular and are available for processes of aesthetic alteration, abstraction and interchangeability. In a computer-based context there is always a conflation of matter and energy processes that enable interaction. Both the literal and metaphorical physics of meaning are integral to the process. This is especially relevant to cyberspace, where environments can be conjoined through networked virtual reality, enabling new forms of communication and intellectual exchange over vast distances through coded flows of energy. How might we re-see the notion of environmental context in terms of "flows," and approach the notion of a "reciprocal precondition between expression and content." (Deleuze and Guattari, 1983, pp.241-242) One can observe the techno-poetic environment in terms of an enfolded set of energies functioning on different levels of abstraction and codification. We say that each environment or context is comprised of an enfolded *field* of energies, ranging from the pure energy of light and sound, to energy as a carrier of codified information, of authored elements; to the energy that propagates computer code; to the energy of computer monitors and sound systems; to the energy of hardware interface, intermingling with the enfolded energies that characterise the *vuser* of this system; to the energy that propagates thought. The entire process functions through a series of translations and interminglings of enfolded energy flows.

The techno-poetic mechanism is an authored environment. The physics of the space is also authored. In the light of this strange experiential domain, "Pataphysics" becomes relevant. This term was coined in 1911 by Alfred Jarry in *Exploits and Opinions of Dr.*

Faustrol, Pataphysician, in which he states, "Pataphysics will explain the laws governing exceptions." (Jarry, 1965) It is an entirely playful physics, but within it one can witness the paradigm shift in the quantum field of physics, lending plausibility to Jarry's poetic realm. Nick Herbert states, in a chapter entitled "Facing the Quantum Facts," that "An instrumental barrier seems to exist which prevents probing the quantum world deep enough to resolve the wave/particle question in favour of one or the other modes of being." (Herbert, 1985, p.67) It was the analogy of this paradoxical study of the characteristics of light — being alternately a wave and a particle, that led me to the exploration of poetic elements that could take on different meanings based on their substitution in alternate contexts. It also led me to acknowledge how different meanings can arise depending on how the *vuser* is conceptually approaching the media. Eco speaking about the poetics of *The Open Work* states:

Perhaps it is no accident that these poetic systems emerge at the same period as the physicists' principle of complementarity, which rules that it is not possible to indicate the different behaviour patterns of an elementary particle simultaneously. To describe these different behaviour patterns, different models, which Heisenberg has defined as adequate when properly utilised, are put to use, but, since they contradict one another, they are therefore also complementary.⁽¹⁾ Perhaps we are in a position to state that for these works of art an incomplete knowledge of the system is in fact an essential feature in its formulation. Hence one could argue, with Bohr, the data collected in the course of experimental situations cannot be gathered in one image but should be considered as complementary, since only the sum of all phenomena could exhaust the possibilities of information. (Eco, 1989, pp.15-16)

The conflation of the different planes of language-vehicle employment — the textual, the pictorial, the musical and the sonic — all present different qualities of conveyance. It is this conceptual interpenetration of media-elements and their ongoing conceptual summing, as perceived by the *vuser*, that is relevant to emergent meaning. Media interrelations are brought about through the operative nature of the techno-poetic mechanism, time-based exploration of mutable context and emergent conceptual material generated through poetic construction and navigation of intermingled fields. I have explored notions concerning the field in poetic works and artistic statements beginning in 1980.² Hayles further develops her thoughts on the concept of the field:

The Twentieth Century has seen a profound transformation in the ground of its thought, a change catalyzed and validated by relativity theory, quantum mechanics and particle physics. But the shift in perspective is by no means confined to physics; analogous developments have occurred in a number of disciplines, among them philosophy, linguistics, mathematics and literature... The essence of this change is implicit in the heuristic models adopted to explain it. Characteristic metaphors are a "cosmic dance," a "network of events" and an "energy field." A dance, a network, a field - the phrases imply a reality that has no detachable parts, indeed no enduring, unchanging parts at all. Composed not

in particles but of "events" in constant motion, rendered dynamic by interactions that are simultaneously affecting each other. (Hayles, 1984, p.15)

Where Hayles sees no discrete elements making up the field, I seek to metaphorically invoke the paradox addressed by Herbert, where the environment can either be seen in the light of waves (an intermingling of fields) or particles (modular-media elements) depending on how it is observed. We can look at individual media-elements as presented in a menu system within my techno-poetic mechanism, or we can view a constructed world of interrelations generated from those individual elements. The mechanism does represent a "network of events" as well as a changing "energy field." In terms of energy fields, the layers of authorship in my techno-poetic mechanism, *The World Generator/The Engine of Desire*, enable a focused procedural set of artefacts presented as elements in the system. The economy of means — condensations, puns, etc. are vehicles of this compression and when unpacked reveal various spokes or alternate layers of meaning.

Various aspects of condensed potential content are activated during navigation. In the introduction to the book *Meaning and Context, An Introduction to the Psychology of Language*, by Hans Hörmann, Robert E. Innis talks about Hörmann's exploration of fields:

Hörmann shows clearly that linguistic actions are stratified events that are embedded in contexts or fields. These contexts or fields make up another aspect of the conditions of sense. They constitute the ultimate socially shared, public frames within which the acts of linguistic communication and use take place. All contribute, in varying degrees, to determining the meaning of the linguistic action. [Innis in Hörmann, emphasis Seaman] (Hörmann, 1986, p.11)

In his writing, Hörmann also approached meaning through a kind of vector analysis. Again we see the use of the term "fields," as descriptive of the functionality of linguistic elements that serve meaning within a social context.

In *Reading Images: The Grammar of Visual Design*, Gunther Kress and Theo van Leeuwen talk about a relation between the visual image and writing as expressed by Barthes:

We want to treat forms of communication treating visual images more seriously than they have hitherto been treated. We have come to this position because of the overwhelming evidence of the importance of visual communication and the staggering inability on all our parts to talk and think in a way seriously about what is actually communicated by means of images and visual design.

In doing so, we have to move away from the position which Roland Barthes took in his essay 'Rhetoric of the Image,' (1977). In this essay (and elsewhere,

as in the introduction to *Elements of Semiology*, 1967) Barthes argued that the meaning of images (and of other semiotic codes, like dress, food, etc.) is always related to and in a sense, dependent on, verbal text. By themselves, images are too 'polysemous', too open to a variety of possible meanings. To arrive at a definite meaning, language must come to the rescue. Visual meaning is too indefinite, it is a 'floating chain of signifieds'. Hence, Barthes said "in every society various techniques are developed intended to fix the floating chain of signifieds in such a way as to counter the terror of uncertain signs; the linguistic message is one of these techniques." (Barthes, 1977, p.39) He distinguished between an image-text relation in which the verbal text extends the meaning of the image, or vice versa. As in the case, for example, of speech balloons in comic strips and an image-text relation in which the verbal text elaborates the image, or vice versa. In the former case which he calls *relay*, new and different meanings are added to complete the image. In the latter case, the same meanings are restated in a different (e.g. more definite and precise) way, as in the case of, for example, when a caption identifies and/or interprets what is shown in a photograph. Of the two, elaboration is dominant. Relay, said Barthes, is 'more rare'. He distinguished two types of elaboration, one in which the verbal text comes first, so that the image forms an illustration of it and one in which the image comes first, so that the text forms a more definite and precise restatement or 'fixing' of it (a relation he calls anchorage). (Kress and van Leeuwen, 1996, p.16)

It is quite obvious that the notion of "anchorage" — in the age of the hyper-link and virtual space, the morph — is no longer adequate to address the unfixity of the recombinant sign. Navigation in cyberspace is about mobility, passage, linkage, processes of association, "lines of flight" (see Deleuze and Guattari, 1987, p.21) and Barthes' "relay." I am not suggesting that I want to destroy the precision of language-image relations; on the contrary, I seek to observe their actual complexity in relation to the mutability of the techno-poetic environment. No single media-element is potentially more important than another in terms of signification within environments that are mutable or reconfigurable. In fact, various hyperlinks, virtual proximities and/or trajectories through media, as chosen by an interactant, can potentially (if not wilfully) shift a particular "anchorage." This is a poetic vehicle to intentionally build upon. Specific forms of drift (non-anchorage), as well as shifting and temporary "anchorage," as Barthes describes it, have long been in poetic evidence. In the techno-poetic mechanism, the removal of anchorage enables the experiential observation of mutable context.

Content is always *potential content* in this work, where meaning arises during use. The notion that poetic elements carry a series (or fields) of alternating potential meanings, is central to the poetic strategies employed in my generative virtual environment. Ushenko presents two kinds of literature in his book, *The Field Theory of Meaning*, a "Literature of Knowledge," one that "seeks to alleviate ambiguity" as well as a "Literature of Power," one which embraces this ambiguity. The following is an example of a form of

scientific nomenclature that Ushenko sees as problematic in his "Literature of Knowledge:"

To begin with examples, we obviously cannot specify — and, therefore, do not understand — the meaning of such a word as "vice," since such words are in different contexts with altogether different meanings. The word "vice" may mean a vise, i.e. a tool for holding an object tight, but it may mean a fault or depravity and it may mean what is meant by the phrase "instead of." It would not help us to observe that such a word as "vice" is a homonym which telescopes within the same visual pattern several different words, each of which is a carrier of a distinct unambiguous meaning. In the first place, unaided by context, the reader cannot tell which of the several alternative meanings he is supposed to choose. And, second, even if an arbitrary choice were allowed- in disregard of the already accepted requirement for objective and communicable meanings- the choice would not provide for an altogether ambiguous word. (Ushenko, 1958, pp.29-30)

It is understandable that one would seek to be entirely articulate with text. Alternately, I am very much interested in the nature of ambiguity as a poetic vehicle and in how meaning is emergent over time within particular contexts. By intentionally loading a system with a resonant selection of specifically ambiguous words and sentences, as well as other media-elements each carrying multiple potential conveyances, through the process of inter-authorship one can experientially observe how meaning is emergent in relation to context.

The choice or authorship of specific media-elements enables me to heighten the probability of the construction of a resonant experience. This specific collection functions as an artistic constraint on the system. I have sought to metaphorically load the dice.³ Instead of saying "vice"⁴ is meaningless in terms of related polyvalent language presented in the techno-poetic mechanism, I would say that it simultaneously carries all of its potential meanings in a state of continuous potentiality. It is this very nature that enables Ushenko to list his different potential readings of the word "vice." If meaningless, the definition could not be articulated. As each context arises, we search through our memory of usage patterns and apply that which is most appropriate. As stated, it is human nature to try to find meaning within an exchange or in terms of a particular environmental context. This is the nature of association and understanding. It is the inter-functionality of the conveying vehicles, as well as their time-based accretion of emergent meaning within my techno-poetic mechanism, that constitutes the sum of the inter-conveying fields. Emergent experience of this relative, operable, cyber-polysemic space, functions as the motivating vehicle of emergent meaning.

In terms of pictorial elements, I have intentionally loaded the system with computer-graphic objects that may suggest alternate readings when juxtaposed with one of the

other members of the collection of media-elements housed in the techno-poetic mechanism. An emergent, time-based context of meaning is generated. It is important to recognise this fact in terms of the "cut/copy/paste" world of postmodernism. Snippets of information are constantly encountered in hypertexts. We do not begin with the assumption that they are meaningless, we seek the construction of the context to narrow the meaning — to specify it. This is especially true in the employment of puns. Ushenko above is talking about his "Literature of Knowledge," one that seeks to alleviate ambiguity. He later speaks of the "Literature of Power" which is more in line with the production of meaning exhibited within the techno-poetic mechanism:

But I would rather wave the point in order to call attention to the fact that the ambiguity of a pun, which is a species of aesthetic ambivalence, is not the objectional ambiguity of a single informative word. The objectionable ambiguity is a cause of mental confusion. The words of a pun are used with a definite meaning in the sense that they are used with a definite double meaning. The mind grasps both components of a double meaning without confusing them. (Ushenko, 1958, pp.36-37)

It is the operative nature of the media in my techno-poetic work that enables the *vuser* to experientially generate context. Ushenko uses the term "extreme contextualist" to describe poetic situations that shift meaning:

In the literature of power there is much to be said in favor of the extreme contextualist's position. In the course of reading a poem context may compel us to revise our original understanding of certain lines. (Ushenko, 1958, p.47)

The techno-poetic mechanism seeks to make observable, in an experiential manner, this very concept. Where Ushenko speaks of the sentence as a unit of meaning he is talking about the "Literature of Knowledge," and not about the "Literature of Power" as he calls it. In poetic space a single word can carry many potential meanings. Saussure's obsessive studies into the anagram show that even the recombination of individual letters can have bearing on the layering of meaning in an individual term. (Starobinski, 1979) This, we must note, is a re-combinatorial, time-based organisation or conceptual relation between individual elements. If we are to borrow the field analogy from physics, I think we can extend the analogy to the subatomic realm. As stated above, media-fragments also contribute to the meaning of a constellation of media elements.

All language depends on context for understanding. The subtlety of context can not be underestimated nor the environmental relations which inform it. In the use of language-vehicles, we continually revise our understanding and augment, or layer with previous understandings that which we have derived from alternate contexts. In other words, thought draws upon the patterns of use that are made available to us through memory

and is weighed against current circumstance. This on-going process of perceptual awareness always impacts on the understanding of context. Ushenko suggests the following:

In a literary piece, at any rate, a dynamic image does not vanish into nothingness but escapes the specification test of objectivity through fading out of focus but not without reverberations in the successors to imaginable prominence which, therefore, would be said to preserve its presence even though in a virtual or attenuated mode. (Ushenko, 1958, p.135)

This notion of a persistence of conceptual "presence" takes on a pivotal role in the volatile electronic environment that characterises the techno-poetic mechanism — "virtual" space. Here we again can apply Peirce's notion that a sign "stands *for* something *to* the idea which it produces, or modifies." (Peirce, 1931, p.171). This process of modification is always in an ongoing mode of application. Ushenko speaks of the transformational nature of meaning over time:

With this conclusion I want to establish the analogy between the transformation of ambivalent being into unambiguous perceptual manifestation, on the one hand and the transformation of the ambiguous words into the meaning of the statement, on the other. In both transformations, initial ambivalence or ambiguity goes with the excess of alternate sets of content and the unambiguous result is obtained by the omission of alternatives or elimination of excess. (Ushenko, 1958, p.143)

The techno-poetic mechanism seeks to experientially manifest situations in which the properties or nature of this "excess" can be intentionally examined. My contention is that forms of excess are common to communication. The study of how excess arises and falls away is central to a contemporary understanding of language use. In particular, contexts that exemplify the intermingling of images, music/sounds and/or text are relevant because "excessive" language use is commonly employed in contemporary poetic construction. To this end Ushenko says the following:

Even ambiguity is in order provided it is contextually controlled and, therefore, causes no confusion; in an exposure of depth and complexity the text of a poem invites alternative interpretations to be played against one another. In short, in a setting of art, the contextually controlled dynamic concreteness of concepts is most conspicuous. (Ushenko, 1958, p.162)

The very nature of exploring the "contextually controlled dynamic" of a work of art is extended and/or transgressed through my computer-based mechanism. The potential for moments of confusion arises as the *vuser* moves through a series of meaning states. The *vuser* of the system can witness how meaning becomes emergent through personal interaction within a generated context. I am seeking to strike a balance between order

and chaos, enabling the *vuser* to take an active role. We can again, metaphorically, invoke Heisenberg — the observer effects the observed, pushing the construction of the environment anywhere. This environment is always constrained by the media-collection that is made available to the *vuser* during use. It can be cleared at will.

It is interesting to note that it is possible to begin with the meaning evoked by a particular media-object and then, with intention, proceed to make the environment into a chaotic mass. The fact that the *vuser* knows that the media-element is a part of this conglomerate mass, extends the meaning of the time-based experience of context. This state (albeit chaotic and confused), also exhibits emergent meaning. The process oriented environment of poetic construction in the techno-poetic mechanism presents an alternate concept of context to that described by Ushenko.

As media-elements are combined, both in real time and through temporal arrangement, a depth of subtle experience is generated, enfolding many different meaning-states through interaction with the environment. A specific loading of the fields provides a set of potentials. It is completed within the experience of the *vuser* as she/he conceptually positions and negotiates the collection of media-elements. Each media-element provides a field of possibility, lending to an ongoing perceptual summing. The perception and activity of the *vuser* of the interactive techno-poetic system drives the potential conveyance of media-elements. There is an intermingling of the intention of the artist/author with that of the *vuser*. This is brought about through the use of a specific media-collection, as explored through the alternate intentions of the *vuser* as they manipulate and explore that collection through environmental interaction.

What I am suggesting is the need for the formulation of a contemporary theory of environmental meaning as it is generated and explored within computer-based environments. The need for a theory of computer-based environmental meaning is only initiated within the scope of this paper. The techno-poetic mechanism and linked narrative, point toward the generation of meaning within an extremely complex, emergent, recombinant, inter-operative field of fields.

1 See Janet Zweig - "ARS Combinatoria, Mystical Systems, Procedural Art and the Computer," *Art Journal*, Fall 1997 Vol. 56, No. 3.

2 The exploration of notions related to the field concept began in 1980 with my work "One Around Which / A Substitution Trajectory in Relation to Subatomic Particle Observation - Congruent Circular Architecture" Seaman 1980; I have also used the concept of fields of meaning to describe my work for many years i.e. see the artist statement "Foci / Resonance" Seaman 1986.

3 In counter-distinction to this approach, Sharon Daniels seeks to erase her authorship aligned with Derrida's concept of erasure through the introduction of media by direct *vuser* input, where the *vuser* injects texts or media from outside of the system. Daniels points toward the potentials of the system in itself in terms of how the system operates in conjunction with this material, taking on an auto-organising and modifying role.

Again the output is emergent but in a qualitatively different manner to my own system. I am seeking a potential resonance to a probable outcome as derived from a specific media-collection; she is seeking poetic resonance in the functioning of the system in relation to the abstraction and/or manipulation of *vuser* media-input through algorithmic means.

4 Ironically, I have explored the word "vice" as a pun in my video work entitled *Home/Homeostatic Range*, Seaman 1983.

1.1.7 The Conveyance of Media-Elements — Music as a Language-Vehicle

In the past, researchers have used certain devices or mechanisms to help embody and/or clarify their research. These devices included logical diagrams, symbolic representations, illustrations, graphs, maps, models, and so on, all functioning in conjunction with written text or spoken language to help define a particular research context. The mechanically printed book — a "technology" greeted with initial fear, as is Virtual Reality — has proven stable as a reliable means of exchange and has served as a vehicle of discourse. The book is different in nature to new forms of electronic discourse that convey through mixed-semiotic (Deleuze and Guattari, 1987, p.147) fields of meaning: hypermedia, virtual environments and forms of digital multimedia. These new technological forms can function as vehicles of both applied research as well as techno-poetic inquiry.

In considering differing media-elements as potential language-vehicles, music and/or sonic material forms one *milieu* of a mixed-semiotic media-collection, housed within the techno-poetic mechanism. Much debate surrounds the notion that music might be considered a language. To some musicians this goes without saying. In *Understanding Computers and Cognition*, Winograd and Flores adopt Maturana's definition of "linguistic behaviour." They suggest the following:

Maturana refers to behavior in a consensual domain as "linguistic behavior." Indeed, human language is a clear example of a consensual domain and the properties of being arbitrary and contextual have at times been taken as its defining features. But Maturana extends the term "linguistic" to include any mutually generated domain of interactions. Language acts, like any other acts of an organism, can be described in the domain of structure and in the domain of cognition as well. But their existence *as language* is in the consensual domain generated by mutual interaction. A language exists among a community of individuals and is continually regenerated through their linguistic activity and the structural coupling generated by that activity. (Winograd and Flores, 1986, p.49)

Computer environments can function as consensual domains, extending human agency through technological means. In fact, one of the most quoted descriptions of cyberspace

comes from William Gibson's *Neuromancer*, "Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts." (Gibson, 1984, p.51) The plastic nature of digital sound as exemplified within computer-based environments define it as a consensual media-element which contributes to the conveyance of an environmental configuration. Music, here, is functioning as a "linguistic" vehicle of meaning when read in the light of Maturana's definition of "linguistics." Specifically, Maturana states the following concerning this "plastic" nature.

When two or more organisms interact recursively as structurally plastic systems...the result is mutual ontogenic structural coupling... For an observer, the domain of interactions specified through such ontogenic structural coupling appears as a network of sequences of mutually triggered interlocked conducts... The various conducts or behaviours are arbitrary because they can have any form as long as they operate as triggering perturbations in the interactions; they are contextual because their participation in the interlocked interactions of the domain is defined only with respect to the interactions that constitute the domain... I shall call the domain of interlocked conducts...a consensual domain. (Maturana, 1978, p.47)

Music potentially functions as a sign, conveying to the listener particular emotive states or "triggering perturbations," as it operates. It functions as a "triggering" device for particular emotions. It motivates difference, through the sonic perspective of its particular semiotic mode of operation. Ontogenic coupling is brought about through computers functioning as a vehicle of interaction. This interaction can be seen as an application of appurtenant technological functionality, operating as a means of generating a consensual domain. This consensuality can happen in *real time* (with some delay) across great distances through the networking of computers. Computers also enable asynchronous consensual experience through authored systems that enable interaction within operative computer-based environments. Winograd and Flores continue:

Language, as a consensual domain, is a patterning of "mutual orienting behaviour," not a collection of mechanisms of the language user or a semantic coupling between linguistic behaviour and non-linguistic perturbations experienced by the organisms. (Winograd and Flores, 1986, p.49)

The use of musical patterning, intermingled with text and images, functions as a "mutual orienting" behavioural trigger. I seek to engage a relation to the exploration of emergent meaning by involving the *vuser* in the generation of a sonic environment, through personal choice and positioning of looped musical elements. This function is currently brought about (in the techno-poetic mechanism), through authored reproductions or representations; digital music loops and recorded spoken text. The

digital music may be of synthetic nature, or recorded from an acoustic environment, or it may present some mixture of these two. The sensual perception of this authored environment, conveying the experience triggered by particular sound-objects as explored through interactivity with that system, exemplifies an application of consensual synthetic behaviour. Maturana provides this definition of the linguistic domain:

The linguistic domain as a domain of orienting behaviour requires at least two interacting organisms with comparable domains of interactions, so that a cooperative system of consensual interactions may be developed in which the emerging conduct of the two organisms is relevant for both... The central feature of human existence is its occurrence in a linguistic cognitive domain. The domain is constitutively social. (Maturana, 1970, p.41, xxiv)

My generative virtual environment seeks to embody authored operational media-elements that, through interactive exploration, can be seen to be consensual. The consensual domain is generated both in networked virtual space, where *vusers* can co-author a virtual environment, or when an individual interacts alone within my artistic environment, functioning as an authored, self-organising (Ashby, 1952) (McCorduck, 1979, p.83), organism-like entity, operating through technological agency. Enter the age of the recombinant poetic. The machine functions, in part, as an appurtenant extension of the linguistic intentions of the non-present author (or authors) of the system. Music, functioning in this light as an operational media-element within the techno-poetic mechanism, could potentially be considered "linguistic" in relation to Maturana's definition. In answering the question, Is music language? I here wish to add some additional perspectives to the discourse. In his book *Musica Practica*, in the chapter entitled "The Inner Fabric of Music," Michael Chanan articulates the following:

If scales are grammatical entities, then the permutations in the notes employed are a matter of syntax. Here, perhaps paradoxically, we discover something close to a universal grammar after all, for it turns out that music using different scales will nonetheless employ the same basic syntagmatic devices: many of the syntactical procedures which generate strings of notes are fundamentally identical whatever the scale system. Music new and old unfolds by a process of structural permutation of groups of tones, consisting of repetitions and contrasts, parallels and antitheses, which constitute in music of any kind- a folk-song, a fugue by Bach or a raga, a jazz combo, a gypsy band, a symphony or a gamelan orchestra - what Stravinski called the game of notes. In Bernstein's words, music is a continuing play of anagrams upon the notes of the scale. (Chanan, 1994, pp.96-97)

One could point out that the anagrammatic quality of the notes in the scale bear a relevant structural relation to the recombinant quality of media-elements within a recombinant poetic work. Here Chanan points out that music is text-like in terms of

scales. Whereas the application of Maturana's definition entitles music to be functional within a linguistic arena, without being mimetic of text in some manner.

It is my wish to understand music as an emotive language-vehicle. It is not explicit in the same way that textual language is, although in the realm of emotion can be extremely explicit. There can never be a sonic dictionary of music made to define music. We must remember that the dictionary is an embodied example of the infinite regress that Peirce elucidates in terms of the sign: "The meaning of a representation can be nothing but a representation." (Peirce, 1931, p.171) Music and text both contribute to the evocative, mixed-semiotic nature of the environment. I am not valuing music over text within the mechanism. The *vuser* may choose any combination of variables from the collection of specified media-elements, to populate the virtual world. Each population will potentially produce a different configuration and in turn, an alternate emergent meaning.

Wilson Coker in the book *Music and Meaning* suggests that music and even fragments of music can be considered as signs:

Just what is a sign? For our purposes let us say a sign is a stimulus that directs or influences some organism's behaviour in relation to something that is momentarily but not necessarily the dominant stimulus in the situation. Subjectively, something (A) is a sign of something else (B) if an organism (O) behaves in the presence of A in a manner appropriate to B. Objectively, something (A) is a sign of something else (B) if and only if in fact A accompanies, follows or refers back to B. With respect to music it should be obvious that even a single fleeting sound or silence may be a sign. Indeed even a single quality of sound- a quality of pitch, timbre, duration, or intensity- may act as a sign. What matters in a sign situation is that whatever acts as a sign in some way or ways causes an interpreter to take account of an object or event. The sonic and rhythmic properties of music have effects on us; they produce dispositions to respond: they potentially are signs. (Coker, 1972, pp.2-3)

Within the techno-poetic environment, musical loops can be positioned in the virtual space. They function as a particular kind of field of meaning and/or sign. Because these loops can be repositioned as well as function spatially within the environment (a musical section goes up in volume as it is approached and goes down in volume as one moves away from it), these musical media-elements shift the evocative reading of a generated space, producing "dispositions to respond" to the environment. The rotating container-wheels of the menu system enable the *vuser* to rehearse different musical loops through an initial listening and subsequently to position these media-elements in the space. The *vuser* can position these loops in the environment and experience the perceptual outcome of their action; interacting with the authored self-organising, organism like environment. Coker continues his thoughts on musical meaning:

To be comprehended at all adequately, the whole concept of meaning as a property of signs must be understood as being of the most fundamental — the biological — order of things. The very fact that some organism tends to respond or does not respond to a stimulus meets the basic condition for attaching meaning to that stimulus. Thus any attitude-feeling, emotion, or desire — any anticipation, any action, or any state of consciousness is significant only insofar as it is a response or a disposition to respond to some stimulus within the internal or external environment of the organism. (Coker, 1972, p.3)

This principal is active within the techno-poetic mechanism. The *vuser* constructs the environment as driven by particular choices; a desire to respond to the authored interactive environment of potential and the authored media-elements housed on the menu system, as well as to respond to media-configurations that have been derived through chance means, or previous *vusers*. Emergent meaning is predicated on the outcome of the *vuser's* interaction, perception and active response to the environment. After the musical loops have been positioned by the *vuser* in the virtual world, an emergent, emotive landscape of interpenetrating musical elements arises and can be explored through navigation.

I have specifically authored these musical loops to heighten the potential of certain musical outcomes, utilising particular pitches, rhythms and emotive qualities as exemplified in the individual variables that comprise the musical media-element collection available to the *vuser*. Coker points to the potential of seeing music as a language. He sites Carnap's understanding of language as one approach:

[Language, emphasis Seaman] ...is a system of sounds, or rather the habits of producing them..., for the purpose of communicating with other persons, i.e., of influencing their actions, decisions, thoughts, etc. Instead of speech sounds other movements or things are sometimes produced for the same purpose, e.g. gestures, written marks, signals by drum, flags, trumpets, rockets, etc. it seems convenient to cover all these kinds of systems of means of communication, no matter what material they use. (Carnap, 1961, p.3)

It is just this sort of description that shows why I have chosen to conflate the definitions of language to produce and explore emergent meaning; describing these media-elements as language-vehicles. From my understanding of this quote, music, digital spoken text, written text, images — both still and moving and computer-graphic objects — could all be conflated under the term "language" in that they function by "influencing their [the *vuser's*, emphasis Seaman] actions, decisions, thoughts" for "the purpose of communicating." This communication, it must be remembered, has as its intention aspects of poetic emergence. Music functions on one plane of the mixed-semiotic set of milieus, as a vehicle of emergence.¹

As stated, the development of a comprehensive environmental theory of computer-based meaning is outside of the scope of this dissertation. I will here elucidate some of the issues which relate to this conflation of "languages" to best understand the problematics surrounding the production of an art work in which emergent meaning is examined and explored. There are many perspectives from which one might enter into this complex discussion. I will cover these perspectives and attempt to point toward some of the problems inherent to this undertaking.

¹ This is not to say that others have not addressed the problems surrounding this issue. In the book *Philosophical Aesthetics An Introduction*, in an essay entitled "Art, Emotion and Expression", Robert Wilkinson talks about two approaches to Music as they relate to language, which he finds problematic. He addresses the work of Deryck Cooke (Cooke, 1950) who speaks of music as a language of emotions and Susan K. Langer who describes music as a symbol of emotion. See (Langer, 1942, 1953, 1964). Julia Kristeva has also articulated a position to music as it relates to language in her book *Desire in Language*. (Kristeva, 1980)

1.1.8 Environmental Engagement

One group of researchers has begun to address environmental meaning in terms of visual design, albeit in a limited manner, from the perspective of "social semiotics."¹ In the book *Reading Images: The Grammar of Visual Design*, Gunther Kress and Theo van Leeuwen outline the complexity of this endeavour in terms a series of historical approaches to semiotics. Although partially relevant to my research, their study proves inadequate in terms of reflecting the complexity of the mixed-semiotic elements inherent to my project. Their research presents a set of perspectives in relation to a new form of semiotics, that can help elucidate aspects of the authorship of the techno-poetic mechanism. Where Kress and van Leeuwen are presenting a perspective as emerging from semiotics, my techno-poetic mechanism seeks to draw from many divergent concepts and disciplines for elucidation. I am applying an emergent recombinant poetic approach to the divergent concepts which inform this process, gleaning those ideas which appear relevant to the project and recombining them to begin to form a new, transdisciplinary coherence. This coherence needs to be seen in the light of the complexity wrought by the contemporary semiotic landscape. Gunther Kress and Theo van Leeuwen suggest the following, by first quoting O'Sullivan:

In 'semiology' countless students across the world are introduced to the terms 'langue' and 'parole', with 'langue' explained, for instance as 'the abstract potential of a language system...the shared language system out of which we make our particular, possibly unique, statements', or in our terms, as a system of available forms already coupled to available meaning; and with 'parole' defined as:

an individual utterance that is a particular realization of the potential of *langue*....By extension we can argue that the total system of television and film conventions and practices constitute a *langue* and the way they

are realized in each programme or film *a parole*. (O'Sullivan et al., 1983, p.127)

We clearly work with similar notions, with 'available forms' and 'available classifications' ('langue') and individual acts of sign-making ('parole') and we agree that such notions can usefully be extended to semiotic modes other than language. But for us the idea of 'potential' (what you can mean and how you can 'say' it, in whatever medium) is not limited by a system of 'available meanings' coupled with 'available forms' and we would like to use a slightly less abstract formulation: a semiotic 'potential' is defined by the semiotic resources available to a specific individual in a specific social context. Of course a description of semiotic potential can amalgamate the resources of many speakers and many contexts. But the resulting 'langue' (the 'langue' of 'English' or of 'Western visual design') is in the end an artefact of analysis. What exists and is therefore more crucial for understanding representation and communication are the resources available to real people in real social contexts. (Kress and van Leeuwen, 1996, p.8)

As Kress and van Leeuwen have extended O'Sullivan's notions, I seek to extend theirs in a non-logocentric manner. My techno-poetic device can make operative the concept of "potential" experiential, as ephemeral and complex as this kind of experience can be. "What exists and is therefore more crucial for understanding representation and communication are the resources available to real people in real social contexts" — a statement like this, concerning "available resources," becomes one central driving problem, informing the construction of the techno-poetic mechanism. How can one inform the construction of this kind of generative mechanism? What media-elements and processes might focus reflection upon emergent meaning, as explored within the social context of a generative virtual environment? In the same breath, we must also ask which media-elements and processes could provide the active aesthetic engagement of a participant? We also seek to know what new contemporary media processes should be considered in the authoring of these environments?

The contemporary technological environment is a "real" social context, albeit a difficult one to come to grips with in terms of the complexity of mutable configurations of signs and the conflation of language systems that are employed to generate it. In the book *Writing Space*, Bolter makes this observation about the computer-based understanding of signs in terms of a non-logocentric approach to language through hyper-text and electronic media:

As text becomes more visual and includes signs that cannot be spoken, the sense of the arbitrary and the mediated increases at the expense of the belief that words are natural, immediate representations of the world. Logocentrism, then, has been diminishing for hundreds of years, at least since the latter middle ages, when silent reading became popular and long before the deconstructionists recognized it as the great problem of western metaphysics... As the act of reference becomes explicit in hypertext, there is a greater emphasis on visual meaning, on diagrammatic signs that cannot be spoken. An aural residue will

remain as we read words on the video screen [computer monitor, eyephones, or digital projection, emphasis Seaman], but that residue is not enough to mask the conventional nature of the game of signs. The conventions become clearer and intrude on the writer and reader as never before- as the writer [*vuser*, emphasis Seaman] sits adjusting the connections between words and images in the text and so redefining the limits of interpretation for that text and as the reader follows out the connections, testing the limits set by the author and delimiting his or her own interpretation. (Bolter, 1991, pp.200-201)

The techno-poetic mechanism explores a non-logocentric approach to enable experiential and mindfully aware reflection upon emergent meaning. This contemporary electronic artistic environment, in part, functions through hyper-links and/or virtual construction and/or navigational metaphors. This art work can potentially be accessed across instant international electronic networks, through modem and ISDN link, or alternately, in individual installations, in galleries and museums covering much of the globe. The proliferation of the mixed-semiotic media-landscape that surrounds us in daily life, one that exhibits complex configurations of signs, in part informs the generation of my techno-poetic environment.

As stated I will use the term cyber-polysemic space to refer to a potential "conglomerate" or layered media space, enabling simultaneous engagement with divergent electronic media. It must be made clear that this time-based space enables the exploration of "states" of meaning in a non-hierarchical mixed-semiotic environment. It is quite obvious that the notion of "anchorage"² as earlier discussed by Barthes as introduced through Kress and van Leeuwen, in the age of the hyper-link and virtual space, the morph etc., is no longer adequate to address the unfixity of the recombinant sign. The metaphors surrounding digital experience, often employed in the discussion of cyberspace navigation, are about mobility, passage, linkage, processes of association and "lines of flight" (see Deleuze and Guattari, 1987, p.21).

The mutability of technological environments, the complex nature of the "accretion" of alternate or augmented "readings" over time as well as virtual spatial proximity, are best expressed by concepts of an ongoing flow and/or an intermingling of "intensities" propagating an emergent environment of forces of difference [*différance*] (Derrida, 1976, p.23).

1 The following quote serves to present a concise historical background to this semiotic perspective, relevant to my project in that it seeks in part to apply "ideas from the domain of linguistics to other, non-linguistic modes of communication:"

We see our work as part of 'social semiotics' and it is therefore important to place it in context of what 'semiotics' is and has been in this century. Three schools of semiotics have applied ideas from the domain of linguistics to other, non-linguistic modes of communication. The first was the Prague School of the 1930s and early 1940s. It developed the work of the Russian Formalists by providing

it with a linguistic basis. Notions such as 'foregrounding' were applied to language (e.g. the 'foregrounding' of phonological or syntactic forms through 'deviation' from standard forms, for artistic purposes) as well as to study the art (Mukarovsky), theatre (Honzi), cinema (Jakobson) and costume (Bogatyrev). Each of these semiotic systems could fulfil the same communicative functions (the 'referential' and the 'poetic' functions). The second was the Paris School of the 1960s and 1970s, which applied to the ideas of Saussure and other linguists (Schefer), photography (Barthes, Lindekens), fashion (Barthes), cinema (Metz), music (Nattiez), comic strips (Fresnault-Deruelle), etc. The ideas developed by this school are still taught in countless courses of media-studies, art and design, often under the heading 'semiology', despite the fact that they are at the same time regarded as being overtaken by post-structuralism. Everywhere students are learning about 'langue' and 'parole'; the 'signifier' and the 'signified'; 'arbitrary' and 'motivated' signs; 'icons', 'indexes' and 'symbols' (these terms come from Peirce, but are incorporated in the framework of 'semiology'); 'syntagmatics' and 'paradigmatics'; and so on - generally without being given access to alternative theories of semiotics (or of linguistics)... The third fledgling movement of this kind is 'social semiotics', which began in Australia, where the ideas of Michael Halliday inspired studies of literature (Treadgold, Thibault), visual semiotics (O'Toole, ourselves) and music (Van Leeuwen), as well as other semiotic modes (Hodge and Kress.) (Kress and Van Leeuwen, 1996, p.5)

2 Barthes and Lyotard both address notions of "drift" (which I will quote in a subsequent chapter).

1.1.9 Virtual Environments

How can one inform the construction of a generative virtual environment, a task that by its very nature is born of the intermingling of disciplines bridging the technological, the artistic and the philosophical? Processes of intuition, imagination and dreaming are relevant to an initial approach to empirical methodologies, as well as to artistic production. In the book *The Evolution of Technology*, George Basalla speaks about "technological dreams:"

Technological dreams are the machines, proposals and visions generated by the technical community, whether in the Renaissance or the present time. They epitomize the technologists' propensity to go beyond what is technically feasible. Fanciful creations of this kind provide an entry into the richness of the imagination and into the sources of the novelty that is the heart of Western technology. They also challenge the conventional depiction of the technologist as a rational, pragmatic, unemotional person dominated by a utilitarian outlook. (Basalla, 1988, p.67)

We live in a time where what was once described through science fiction can now become authored scientific fact. *Neuromancer* by William Gibson (Gibson, 1984) and *Snow Crash*, by Neil Stephenson (Stephenson, 1992), epitomise fictional visions of virtual environments. Gibson, in *Neuromancer*, described a particular kind of space he termed cyberspace¹. He makes the following description of cyberspace:

Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts...A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights receding. (Gibson, 1984, p.51)

This passage has been often quoted and has become the suggestive birthplace of "cyberspace," at least the initial coining of the term. The notion of a networked, *consensual* symbolic vision, brought about through computer-based technology, is now a reality. In fact, *The World Generator/The Engine of Desire*, my techno-poetic mechanism, presents a related virtual space. A much later description of a cyberspace was articulated by Neil Stephenson in *Snow Crash*. The following is his description of a space he calls the metaverse:

So Hiro's not actually here at all. He's in a computer-generated universe that his computer is drawing onto his goggles and pumping into his earphones. In the lingo, this imaginary place is known as the metaverse. (Stephenson, 1992, p.22)

Stephenson continues:

...It's just a computer-graphics protocol written down on a piece of paper somewhere — none of these things is being physically built. They are, rather, pieces of software, made available to the public over the world-wide fiber-optics network. When Hiro goes into the Metaverse and looks down the Street and sees buildings and electric signs stretching off into the darkness, disappearing over the curve of the globe, he is actually staring at the graphic representations — the user interfaces — of a myriad different pieces of software that have been engineered by major corporations. (Stephenson, 1992, pp.23-24)

Even as virtual reality was in its infant stages, Stephenson saw the "meta" potential of the virtual environment — naming it a metaverse. The potential for authoring virtual environments, reflecting the conceptual and aesthetic sensibilities of the artist, opens up an entirely new field of poetic inquiry. I here present a series of quotes outlining some perspectives on virtual space, with brief notes on how each relates to the project:

Consciousness itself is no absolute category *apriori*. Boscovich defines this mutual relationship between awareness and the physical world with the complicated idea of "compenetration" and the coexistence of points of matter in time. Consciousness derives from the compenetration of matter and spirit, as their designated process...Virtual reality is a journey into imaginary Boscovich space, where real and possible are contrived in coexistence, in compenetration. Their fascination lies in the simulated defiance of all classical laws of nature, of the tyranny of here and now, space and time conquered. Traditional spatial concepts disintegrate when I can see my own hand in simulated space, when I can observe real and imaginary objects react to my actions... Here, however, the visual spectrum of the spectator and pictorial space of the image intermingle, collaborate, as anything the spectator does in pictorial space, he does in his real environment. The virtual environment is not the real world, but a representation of the real as artificial reality, where wish fulfilment still corresponds to reality, where interior and exterior, imagination and reality, I and other are all bridged. Myron W. Kruger defined "artificial reality" as an environment controlled by computers who register our needs and react to them. (Weibel, 1990, p.29)

My generative virtual environment presents a related space, intermingling the real and the representation in a mutually reciprocal manner. It is a computer-based space that "responds" and "reacts" to the wishes of the *vuser*, as articulated early on by Myron Kruger. It enables an exploration of "consciousness" through a "compenetration of matter and spirit."

So-called virtual reality systems enable us to experiment with the dynamic integration of different perceptual modalities. (Lévy, 1998, p.38)

In particular, the techno-poetic mechanism enables an individual to conjoin aspects of touch, in terms of the physical interface as it is dynamically linked to the reactive environment, vision and auditory sensuality.

The primary research instrument of the sciences of complexity is the computer. It is altering the architectonic of the sciences and the picture we have of material reality. Ever since the rise of modern science three centuries ago, the instruments of investigation such as telescopes and microscopes were analytic and promoted the reductionist views of science. Physics, because it dealt with the smallest and most reduced entities, was the most fundamental science. From the laws of physics one could deduce the laws of chemistry, then of life and so on up the ladder. This view of nature is not wrong; but it has been powerfully shaped by available instruments and technology. The computer, with its ability to manage enormous amounts of data and to simulate reality, provides a new window on that view of nature. We may begin to see reality differently simply because the computer produces knowledge differently from the traditional analytic instruments. It provides a different angle on reality. (Pagels, 1988)²

It is the operative nature of this "new window" that enables us to experientially explore recombinant virtual worlds constructed through *vuser*-actuated manipulation and delicate management of "enormous amounts of data."

Imagine a wraparound television with three-dimensional programs, including three-dimensional sound and solid objects you can pick up and manipulate, even [potentially, emphasis Seaman] feel with your fingers and hands. Imagine immersing yourself in an artificial world and actively exploring it, rather than peering at it from a fixed perspective through a flat screen in a movie theatre, on a television set, or on a computer display. Imagine that you are the creator as well as the consumer of your artificial experience, with the power to use a gesture or word to remold the world you see, hear and [potentially] feel. That part is not fiction. (Rheingold, 1992, p.16)

The notion that one is the "creator as well as the consumer" of an "artificial experience," is central to the exploration of emergent meaning through my techno-poetic device. I am exploring a space which is accessed from a screen, and not through goggles. It is equally navigable.

The contemporary notion of virtual reality as a subset of cyberspace is an extreme example of the substitution of the material world for an immaterial and symbolic one. In [immersive, emphasis Seaman] virtual reality the user electronically wraps him-or herself in symbols by means of electronic

clothing...producing the illusion of inhabiting the virtual world displayed inside the fold. It is as if one were capable of moving around inside a drawing that responds to one's changing point of view... (Morse, 1998, p.17)

I have authored a specific virtual space, exploring the "symbolic" generation of a series of relationships for this project. It is not an immersive virtual space, although we feel to be "inside the fold." In terms of the nomenclature, an immersive virtual environment is only produced through 3D goggles (or other forms of display that cover the eyes). The darkened nature of the room housing the techno-poetic mechanism, the high resolution of the screen and the palpable sense that one is moving through space make the experience a highly immersive experience. The techno-poetic environment is comprised of 3D, computer-based object/drawings that respond "to one's changing point of view." The *vuser* does not put on goggles and wear a suit. This kind of apparatus is clumsy and difficult to manage for a large art audience. The *vuser* can, however, construct poetic worlds and subsequently navigate within those worlds.

The computer now enables us to embody our own personal creative vision differently from any other technological device in the past, through the authorship of computer code. The notion that this vision can become *operative* is central to my research. The concept of *operativeness* was already being discussed in 1842 by Ada Augusta, Countess of Lovelace, in terms of ideas surrounding the *Analytical Engine*. The Analytical Engine was a device considered to contain the seeds of ideas that now are central to digital computing. In her *Notes by The Translator* written to clarify the textual work entitled *Sketch Of the Analytical Engine Invented by Charles Babbage* by L. F. Menabrea, Lovelace made some very enlightened remarks:

The Analytical Engine is an embodying of the science of operations, constructed with particular reference to abstract number as the subject of those operations... Again, it [The Analytical Engine, emphasis Seaman] might act upon other things beside *number* were objects found whose mutual fundamental relations could be expressed by those of the abstract science of operations and which should be also susceptible of adaptations to the action of the operating notation and mechanism of the engine. Supposing for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expressions and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent... It may be desirable to explain, that by the word operation, we mean any process which alters the relation of two or more things, be this relation of what kind it may. This is the most general definition and would include all subjects in the universe. (Babbage, 1961, p.249)

In this note we see the conceptual seeds of ideas relevant to the authorship of the techno-poetic environment. The operative exploration of "aesthetic" media-elements is central to an examination of emergent meaning. It is significant that this note suggests

the aesthetic potentials of the computer even before its functional creation. It was the visionary attitude and "Technological Dreams" (Basalla, 1988, p.67) of Babbage and Lovelace that set the stage for computing as we know it today.

1 See also *Cybernetics* (Wiener, 1948 & 1961, 1967, 1985).

2 This quote is also found in (Rheingold, 1992).

1.1.10 Salient Processes

I have sought to develop a functional techno-poetic mechanism to observe the nature of emergent meaning. A specific generative virtual environment has been authored that enfolds various operative computer-based processes activated through *user* interaction. The participant potentially brings about: interpenetration, juxtaposition and aesthetic alteration of media-elements through interaction with the following categories of "operative" processes:

- poetic construction processes;
- navigation processes;
- processes related to authored media-behaviours,
- editing processes;
- abstraction processes;
- automated generative processes;
- processes related to distributed virtual reality;
- and chance processes of a *semi-random* nature.

Earlier I have outlined the different kinds of media-elements that can potentially populate the environment. I will here elaborate on each of the processes that can be dynamically engaged through interaction, to functionally operate upon those media-elements:

1) Poetic construction processes:

Construction processes enable the assemblage of media-elements to form a temporary set of media relations within a mutable, time-based virtual environment. Any media-element can be set in relation to any other media-element. This includes the potential of juxtaposing a copy or copies of that same element, i.e., a particular poetic sentence can be juxtaposed to an image or musical loop, altering or augmenting the evocative nature of a constructed spatial context. It must be noted that each media-element potentially impacts on the evocative nature of others media-elements, through environmental

proximity within a particular constructed media-world. The employment of media-elements is non-hierarchical in nature. One does not value text, over image or sound. In each instance the particular media-element can be "weighed" by the *vuser* in terms of how its conveying-force informs an environmental set of meanings. Different construction processes vary the evocative qualities that the world can potentially convey.

2) Navigation processes:

Navigation processes enable the *vuser* of the computer-based mechanism to move through and experience media-elements within a virtual, digital multi-media environment, taking various or alternate trajectories through the spatial-media. This time-based *point of view* or *perspective* can shift the *conveyance* of media-elements depending on *virtual location* and virtual proximity, within the electronic environment. In other words, from one angle of vision we observe something which actually turns out to be something else when viewed from an alternate perspective or proximity. We can also be so close to a virtual object that it obscures our vision of other objects in the space. Along with this spatial perspective, the interpretation or *evocative nature* of the media-environment can also be shifted, based on an understanding that is suggested through the order or sequence of navigated media-material, thus forming an accreted environmental conveyance. Because media-elements of a diverse nature can be revealed through navigation (and this revealing is dependent on the movement of the illusionistic edge of a virtual object), we could use the term operational or spatial-montage¹ to refer to the dramatic juxtaposition of differing media-elements in virtual space, extending concepts initiated by the film-maker Sergei Eisenstein into the virtual realm.

3) The Exploration of authored media-behaviours:

Media-behaviours² can be described as pre-defined behavioural attributes authored into the computer-based system. These behaviours become activated or are encountered by the *vuser* during interaction. A specific behaviour can be attributed to a particular media-object, where that element subsequently behaves in a particular manner, i.e., spins, rotates, levitates, moves in a spiral, etc. This kind of behaviour can be defined by the *vuser* of a system within the techno-poetic mechanism through a specific menu choice. The behaviour is made active within the environment through the attachment of a *selected behavioural attribute* to a chosen media-element. This is brought about through the choice of a particular "glyph" presented on the menu system when a *selected* media-element is highlighted by the "aura," (the selection device that enables functional choice of media elements within the system). I will elaborate on the "aura" in the chapter entitled "A Specific Techno-Poetic Mechanism Exploring Emergent Meaning: *The World Generator/The Engine of Desire*." Behaviours are pre-authored as one set of

menu choices and can potentially be attributed to any of the different media-elements. A set of behaviours may already be active upon entrance into a particular media-environment if a previous *vuser* has chosen or activated them and left the process in midstream. A behaviour may also be triggered in relation to particular actions or human behaviours that the *vuser* of the system has undertaken. (Plans for implementation of higher levels of authored behavioural complexity have not as yet been implemented).³

Another behavioural trigger is activated through the virtual proximity of the *vuser* to spatial text elements that have been entered into the space, i.e., if a person navigates close to a particular piece of poetic text positioned in the virtual space, that text is "spoken" (the digital audio file is played).

4) Editing Processes - aesthetic abstraction processes:

The potential for the participant to *edit* or operate upon the media-elements is also pertinent to the exploration of emergent meaning. Editing can alter the aesthetic of the media-element in a variety of ways including scaling the media object or picture, stretching or compressing the object/image, changing the level of transparency, moving the object/image, substituting a particular texture map for another and alternating the texture map, altering a connected sound or behaviour and deleting the object. Editing of this sort may be explored to varying degrees by each participant. The more time that is spent with the system, the more understood its various potentials. The *vuser* may also clear the world of elements and start with an empty *plateau*.

5) Automated generating processes:

An automated generating process is one in which the computer itself takes an active role in the process, constructing emergent media-environments through the automated engagement of particular computer code. In a subsequent chapter I will discuss the potential employment of *re-embodied intelligence* as an approach to automated construction processes, where the computer functions as a translated, programmed extension or abstraction of the mind-set of the author.

6) Processes related to distributed virtual reality:

The potential of networking the techno-poetic mechanism enables more than one person to *virtually-inhabit* the virtual environment simultaneously. Multiple users of the system, in different international geographical locations, can be in the same virtual environment concurrently. We can expand upon the analogy of the telephone call — two or more people in different locations sharing the same electronic verbal space. In the example of my techno-poetic mechanism, a video phone is employed. The video "avatar" or digital video representation of the participant is re-routed from the video

phone into the virtual environment, where it is also presented and mapped onto a flat object. As the participant navigates, a video representation of them moves to a relative proximity within the virtual environment. Multiple participants, in international settings, can converse and act upon connected copies of a single environment while sharing the experience and conversing about it in an intimate manner, all within consensual electronic space.

7) Chance processes (within specific ranges)⁴

A set of chance-oriented processes are made available to the *vuser* through the techno-poetic mechanism. They include the chance selection of differing media-elements, i.e., random object; random sound; random text; random texture; random movie; random behaviour; random behaviours (activating an entire set of media-elements with attached behaviours); as well as the construction and positioning of groups of media-elements, as brought about through chance means and computer-based processes: random world and random all (thus engaging an elaborate set of potential menu choices in the environment, through automation). Random world and random all are also examples of *re-embodied intelligence*.

The processes explored above are all potentially engaged in the cyber-polysemic space of the generative virtual environment. They function alone and/or in combination, to generate and explore emergent experience.

1 See the description of Eisenstein's concept of Montage in the chapter entitled *Other Concepts Relevant to the Notion of the Conceptual Machines: Operational Montage*.

2 A simple example of a behaviour found in a common mouse driven interactive work, would be the flashing or altering of a media-element that has been selected. In this case the behaviour functions as a feedback mechanism, letting the user of the system know that they have engaged a particular choice.

3 These behaviours include having the media-element "follow," "hide," "disappear" or "react" by changing in some manner, in relation to the user's actions. The triggering of behaviours might be accomplished through spoken commands utilising voice recognition systems, the manipulation of a physical interface device and/or interactivity with different sensing devices such as a video camera or sonar system (among other forms of sensing devices). It was also planned to incorporate alive behaviours as a particular choice.

4 As earlier noted, these are *semi-random* processes in that random parameters are chosen within specific ranges.

1.1.11 Baudrillard's Simulation and Simulacra

We could say that the processes discussed in the last chapter can be explored within an environment of *Simulation and Simulacra*. (Baudrillard, 1994) Computer-based digital multimedia is made palpable within highly mutable electronic spaces. The very nature of our understanding of context has been altered because of the unfixedity of these

technological surroundings. In his book *Simulacra and Simulation*, Baudrillard argues the following:

Today abstraction is no longer that of the map, the double, the mirror, or the concept. Simulation is no longer that of a territory, a referential being or substance. It is the generation by models of a real without origin or reality: A hyperreal. The territory no longer precedes the map, nor does it survive it. It is never the less the map that proceeds the territory — precession of simulacra — that engenders the territory. (Baudrillard, 1994, p.1)

It is true that a map can engender a territory in terms of the creation of virtual landscapes, positing so called "hyperreal" worlds. This is also true of working diagrams, architectural models and various texts which can project "hyperreal" environments. From the perspective of an artist using "models" to populate virtual worlds, one knows these "models" to have a very definite "origin" — they are authored using a contemporary tool, the computer, functioning in conjunction with a specific *authored* program or newly authored computer code. These "models" subsequently are housed in an illusionistic spatial environment that is also "authored." In the past, a pencil or pen made renderings of a scale model of a particular building on a piece of paper. We can now construct operational models through computer-based technology that enhance the nature of palpable visualisation.

From my perspective (that of the artist/researcher) virtual environments can be authored as a tool of social critique and aesthetic inquiry. My techno-poetic mechanism is authored specifically for the exploration and examination of emergent meaning. Virtual environments can further differing forms of investigation, including scientific visualisation and the positing of architectural imagination, as well as philosophical concerns. Coyne, in his book entitled *Designing Information Technology in the Postmodern Age*, points out that Derrida also had problems with Baudrillard's point of view, suggesting: "From the Derridean reading, the essence of communication, or more accurately protowriting, lies in the very features that lead to these [Baudrillard's, emphasis Seaman] complaints." (Coyne, 1995, p.117).

Authors and researchers have a variety of intentions for their use of virtual environments. The extent to which virtual environments are employed as mapping tools relates to an individual author's intention. Virtual Reality (VR) can be a simulation of an external "territory," with the potential of being its own virtual territory. VR can be used for an exact kind of mapping (as in some new forms of surgery or telepresence), or, alternately, as a poetic realm. The Virtual Reality space can present a one-to-one "map" of digital-artefacts derived purely from imagination, or by another level of abstraction that conjoins both realms of mapping. A virtual environment may be highly

"referential," enabling one to experience a model of a space before actually entering it, or to explore a direct map of a space from a distance, through telerobotics. We must also remember that an abstraction can also be referential to varying degrees. The computer is a *tool* and it can be used imaginatively. It can potentially propagate the visualisation and sonicisation of *constructed* space. This should not be lamented in my mind, as suggested by Baudrillard. The possibility for media construction is central to the generation of emergent experience. Baudrillard continues:

This imaginary of representation, which simultaneously culminates in and is engulfed by the cartographer's mad project of the ideal coextensivity of map and territory, disappears in the simulation whose operation is nuclear and genetic, no longer at all specular or discursive. It is all of metaphysics that is lost. No more mirror of being and appearances, of the real and its concept. No more imaginary coextensivity: it is genetic miniaturization that is the dimension of simulation. The real is produced from minaturized cells, matrices and memory banks, models of control- and it can be reproduced an infinite number of times from these. It no longer needs to be rational, because it no longer measures itself against either an ideal or negative instance. It is no longer anything but operational. In fact it is no longer really the real, because no imaginary envelopes it anymore. It is hyperreal, produced from a radiating synthesis of combinatory models in a hyperspace without atmosphere. (Baudrillard, 1994, p.2)

Baudrillard seems to ignore the tenuous relation of text to reality in this view, although his statement has relevance on both a literal and metaphorical level to the generative virtual environment that I have authored for this project. We must remember that along with the metaphor of the recombinant, computers also enable the literal exploration of recombinant DNA processes. When we talk about "Hyperspace," we keep in mind that electronic environments — like those engendered by the techno-poetic mechanism — explore authored (and/or inter-authored) spaces. They, like a good book, are given the atmosphere that the author or authors deem appropriate.

A virtual environment can function as a space to contemplate contemporary metaphysical processes. This is not to suggest that there should not be an ethics to these realms. When Baudrillard suggest that we can no longer ascertain the "real and its concept," I beg to differ. It is this "real" technological environment that we must carefully consider in terms of all of its ramifications both positive and negative.

How can we best manifest this consideration concerning the nature of Virtual Reality in a manner that truly addresses the functional nature of these systems? Virtual environments can only exist because of the real, through the language of computer code and human effort functioning in relation to the physical realm of hardware and virtually inhabited space. Yes, it must be stated that the computer can potentially posit volatile

spaces that are characterised by an unfixity only surpassed by human thought processes. It is the very nature of this computer-based mutability and its concomitant relation to the meanings produced within this form of environment, that I seek to entertain and experientially examine.

I have developed a techno-poetic mechanism in order to explore the interrelations that arise through the exploration of "operative" media-elements. My mechanism seeks to become a platform to consider in an informed manner, a generative poetic/conceptual environment that can shift conveyances in multiple ways, forming an emergent trajectory of poetic thought and association as brought about through *vuser* interaction. The techno-poetic mechanism has been authored as a variable "aesthetic" environment, with a carefully considered atmosphere of potential. Although my virtual environment does not become an exact "mirror of being and appearances, of the real and its concept," we must remember that a slight displacement of the "real" can also serve to illuminate that "real."

The techno-poetic mechanism is a specific generator of "appearances." I have sought to construct an "operative" techno-poetic environment, which will function with all of the depth that a collection of media-elements and media-processes can, to manifest a shifting and malleable poetic territory. This territory is to be considered both in a "specular" manner and as a vehicle or extension of "discursive" practice.

1.1.12 The Generation of a Techno-Poetic Mechanism

We are existing in a new era of technologically-mediated, environmental language-vehicle use. We must as a technological culture come to understand the qualities and ramifications of virtual environments. Recombinant poetics, as an emergent field, seeks to begin to address many of the issues inherent to this complex topic from the perspective of art practice.

This research has sought to define the computer-based functionality that this kind of techno-poetic mechanism should facilitate, informed by the historical study of relevant technological mechanisms and various approaches to media; develop a working prototype of the software interface; develop a working prototype of hardware interface; test and re-test these prototypes; revise the mechanism and extend the functionality of the prototype based on the findings of the tests; author a series of media-elements of image, music/sound and text; and load the working prototype with these digital media-

elements, informed by the historical study of differing art practices (as well as other discursive practices deemed relevant to the project). The techno-poetic mechanism presents the potential of combining and recombining "chosen" media-elements and processes. A prototype exploring all of the above foci has been created, tested, altered, further tested, honed and finalised.

Although the historical surveys and a relevant series of concepts informing the authorship of the techno-poetic mechanism will follow, I will present an initial description of this device to help elucidate the enfolding of my transdisciplinary researches.

1.1.13 A "Working" Description of the Mechanism: *The World Generator/The Engine of Desire*

Let us imagine sitting down at a table in front of a fifteen-foot wide projection screen in a darkened room. On the screen we begin with an empty plane or *plateau*¹ like space — an empty field. (We remember that the *vuser* can enter the poetic construction process at any stage, encountering a space that has previously been inter-authored). At the touch of a physical button built into the table, marked *Menu*, we instantly see a bookshelf-like system of small compartments appearing across the bottom of the screen. We position the wheels using the track ball. If the track ball is spun from left to right or from right to left, an outlined selection area (a blue square) moves across the container sections which include a series of system functions, media-objects, a series of random functions, behaviours, pictures (digital still images), digital movie loops, short poetic texts and musical loops. The menu system displays all potential media-elements and processes. In situations of normal gravity, objects would fall out of these containers as they spin. This system functions in virtual space. It is a pataphysical environment, exhibiting its own, authored, computer derived physics.

Directly in front of us, built into the physical table, is the track ball used to spin the wheels on the screen and to move across the wheels, over a series of container compartments. A second ball, slightly raised over the table, is used for navigation across the virtual *plateau* space, populated by selections from the spinning container-wheels. The two buttons, one marked *Menu* and the other marked *Select*, enable us to toggle the menu-wheels on and off. *Select* allows us different choices from the menu.

The virtual shelves bend backwards and around, eventually connecting the top to the bottom, forming a looped set of shelves, defying normal physics. A second tap on this

button blows up the *Menu* to the size of the entire screen. A third tap on the button removes it from the screen. We can imagine a Rolodex which we hold and spin before us. Unlike a Rolodex, this is an entire set of virtual compartments which bend around to form a series of separate adjacent spinning container-wheels. One set of wheels holds a series of hundreds of 3D objects that I have authored. For the sake of our mental picture, think of common objects like a model of a simple table; a chair; a set of chess pieces; a step ladder; a vessel. More abstract, geometric, sculptural objects are also housed in other containers. All of these models are presented in the same overall colour on the container wheel, a light blue-grey.

Once placed onto the viewing plateau in the virtual space, unlike a simple picture, the 3D models can be observed from all angles. We can select a particular 3D model by moving a bright blue selection square across the selection wheels (the container-wheel menu), with the track ball. The track ball, like the menu button, is presented in physical space on the interface-table, dynamically linked to the virtual menu. Movement of the track ball initiates a parallel movement of the virtual menu on the screen. Spinning the ball vertically spins the menu. Spinning the track-ball horizontally repositions the blue selection-square. Taping on the *Select* button, also found directly in front of us on the physical table, signals a selection; and the 3D object (or any selected media-element) is then placed onto the plateau space, before us. In other words, this media-element is placed into the space in front of the virtual position where we, the *users*, are located. We are empowered to enter into a virtual landscape and move around, seeing objects on the plateau from any direction.

Once a particular model is selected and entered into the space, we, the users of the mechanism navigate (using the space-ball on the physical interface) and observe the media-object from all sides, as well as from slightly above and slightly below. (I have constrained this movement in the world so that we do not flip upside down and become entirely lost. Twisting the space-ball to the right enables us to pivot to the right in the space. Twisting the space ball to the left enables us to pivot left. Pressing the ball forward enables us to move forward in the space. Pulling the ball backward enables us to move backward. Tilting the ball enables us to look up or down. A small black button on the space ball toggles the aura on and off, enabling us to operate on any media-element directly in front of our current virtual position in the space. It takes a few minutes to acclimate to these controls. Once the system's functionality has been learned, the exploration of the environment feels quite natural.

I have included a menu item that brings us back to the centre of the virtual world. The virtual space is expansive and we can position media-objects anywhere on the plateau.

If the media-element is an object of some kind, we can *project* an image (texture map) or movie (moving texture map) onto its surface. We may also present an image or movie in the space, on a virtual-nested screen. The picture, suspended in virtual space, can be navigated around or a particular behaviour can be attached to it. The environment has been optimised so that a digital movie will only play when we are virtually close to it.

The interface is thirteen units, or containers, across. I will here present a breakdown of the categories presented on different wheels. There are five sets of containers holding 3D objects. A set of two wheels holds a series of pictures including landscapes, close up figurative pictures, and a series of abstract images. A third grouping of wheels contains digital movies. Another wider wheel contains short poetic phrases. The final wheel, moving left to right, holds a series of sound-objects. These sound-objects are pre-composed digital audio loops that can be positioned in the virtual space. Other wheels contain a series of digital processes that we can access to operate on the elements in the construction of the world (I have articulated these processes above). We can begin to picture this elaborate series of wheels, presented side by side to create this spinning container-wheel — the virtual menu system. Please see the enclosed CD-ROM documentation for a detailed illustration of the work. (It must be noted that the CD-ROM presents documentation of the techno-poetic mechanism and not the generative virtual environment itself.)

These compartments rotate on the outer surface of this virtual container-wheel system. There are slight gaps between each of the different kinds of contents. The menu wheels have the appearance of a circumference of 14 compartments although the system has been designed so that instead of circular wheels, these containers can become long belts to house a huge selection of digital variables, i.e., the short poetic phrases presented on the menu actually are comprised of three-hundred and seventeen lines of text, presented on a long belt that is not visible (see the appendix Figure 3. or the CD-ROM to read this elaborate poetic text). We only see the front side of the wheels. The track ball on the physical table enables us to spin the virtual container-wheels forward and backward, as well as move across the face of this sets of wheels, positioning the dark-blue outlining box around chosen containers. By pressing the physical button on the table marked *Select*, we make a choice from the virtual container-wheels. This selection is instantly entered onto the virtual field, onto the *plateau*. As stated, the menu can be toggled on and off the screen, enabling an unencumbered view of the *plateau*. We see these compartments rendered in 3D. Using the bookshelf analogy, imagine that we can spin the wheel looking for a particular item contained on these 3D shelves. Once the desired

selection is found, we can press the *Select* button on the physical table; instantly our virtual selection, is placed on the *plateau*.

As selections are entered onto the *plateau*, the field of vision and sound grows in complexity. At any time we can navigate within this virtual field and discuss and/or observe the media-elements that populate it. The ways in which these objects can be combined and/or interpenetrated further enhances the complexity of the visualised space. I will go into more elaborate detail about this device in the chapter entitled "Techno-poetic Mechanism: *The World Generator/The Engine of Desire*."

¹ See *A Thousand Plateaus* (Deleuze and Guattari, 1987).

1.2 Computer-Based Emergent Meaning: Environmental Relations

Differing forms of combination, interpenetration and recombination, as engendered through interaction and inter-authorship with a specific collection of media-elements, can potentially enable the conveyance of emergent meaning within my virtual environment. The question is, can one define emergent meaning in more than one way? In terms of computer-based media, in the past the possibility of generating emergent meaning has primarily been seen as a characteristic of artificial-life programming.

¹ See *Artificial Life: An Overview (Complex Adaptive Systems)* (Langton, 1995) Langton's definition of emergent behaviour is qualitatively different to that exhibited within my techno-poetic mechanism. Some artists like Christa Sommerer and Laurent Mignonneau, have explored hybrid a-life/constructive environments. See my discussion of their work *A-Volve* in the section "A Survey of Hybrid Technological/Literary and Artistic Works — Toward the Definition of a Field: Recombinant Poetics."

1.2.1 Emergence

According to Parker, the definition of the word "recombinant " is "Any new cell, individual, or molecule that is produced in the laboratory by recombinant DNA technology or that arises naturally as a result of recombination." (Parker, 1989) I have stated that I was applying the term recombinant in a metaphorical manner. In extending the media-molecule metaphor, we can begin to define a particular environmental concept of emergence as it relates to the exploration, juxtaposition and interpenetration of media-elements, all forming a molecule-like assemblage. In *Complexification*, John L. Casti, a professor and researcher at the Santa Fe Institute, provides this comment on the nature of emergence as it relates to this form of molecular occurrence:

This expression [H₂O, emphasis Seaman] is a particularly crude form of what might be charitably called a model to explain the formation of water from hydrogen and oxygen. But note that the starting point for this scientific explanation was the wholly unexpected and seemingly unlikely observation that by combining rather active gasses, we can form not only liquid but a liquid whose properties differ radically from the properties of either of the constituent parts. (Casti, 1994, p.4)

It is my contention that a system that enables the exploration, juxtaposition and interpenetration of a series of poetic media-elements (along with their aesthetic and behavioural abstraction) can exhibit emergent properties through the combination, recombination and interpenetration of those media-elements and processes. When mixed together, these media-elements can form a "molecular" environmental engagement that "radically differs from the properties of either [any, emphasis Seaman] of the constituent parts." (Casti, 1994, p.4) I am interested in processes of media-

combination and recombination and in particular how these processes effect what an environment conveys or evokes. Each "media-element" in the system is handled as a mathematical model through digital code. The dynamic qualities exhibited through the systematic intermingling of these models enables the appearance that we are occupying and navigating within a particular computer-based environment. I have sought to create a functional, generative, techno-poetic mechanism to enable a particular intuitive ease in the manipulation of these models, as well as a naturalness of navigation through complex configurations of "media-elements," once assembled into a new grouping. Casti elaborates on the nature of observation in terms of code and the scientific method:

So what do we mean by an observation? In everyday parlance, an observation is just the memory trace left behind in our brains when the outside world impresses itself upon us via our sensory channels of sight, sound, touch, smell or taste...In science we usually try to code these memories by numbers, mostly for the sake of compactness and so that we will have a common scale by which to compare different observations. This kind of coding also has the salutary side effect of providing the basis for representing the observations in symbols, hence allowing us to encode the world in stylized mathematical terms. (Casti, 1994, p.4)

The techno-poetic mechanism presents an environment for engaged "observation." Central to my project is the fact that the media-elements encountered within the techno-poetic mechanism are encoded variables that potentially visualise referential and/or abstracted information. The computer presents a particularly malleable environment, potentially stimulating us both intellectually and sensually, enabling the "observation" of various constellations of media-elements. Within this space, one can witness the "emergent " or "suprising" (Casti, 1994, p.ix) shift from one state or quality to another. Even the observation of a fragment of a media-element — a sliver of an image or word fragment, a short portion of a musical loop, the intermingling of a mass of spoken textual material can also contribute to the evocative nature of the environment.

The *vuser* begins with a set of specific media-variables, some already in "molecular" form. Media-elements can become fragmented through spatial interpenetration, or by the intersection of behavioural trajectories, as well as through layering and intersection. All variables and even fragments of media-variables are fields in their own right, contributing differing meaning forces to the ultimate summing of an experience — the production of environmental meaning within an inter-authored generative virtual environment.

Meaning emerges in varying contexts through the *use*¹ of particular language-vehicles. If we alter the context through juxtaposition, interpenetration, superimposition and/or recontextualisation of these chosen media-elements, the meaning or reading of a given

element or set of elements can potentially shift. It is this change that is metaphorically analogous to the alteration brought about by the mixing of hydrogen and oxygen. We could say that a combined set of elements forming a context generates a "recombinant" media-molecule. This points to a high level shift in our understanding of the evocative nature of these language-vehicles, experienced within a set of differing contexts. A dynamic molecular relation potentially arises out of what appears to be a set of modular elements. Alternate molecular relations can also potentially arise through further interaction. Casti talks about this kind of emergence as being a "science of surprise." He writes:

In everyday parlance, the word surprise represents the difference between expectations and reality; the gap between our assumptions and expectations about worldly events and the way those events actually turn out...

... Systems displaying surprising (i.e., unpredictable) behaviour are more or less synonymous with those we regard as being in some way "complex." (Casti, 1994, p.ix)

It is this quality of "surprise," that comes about within a recombinant environment that points to the very character of emergence. Each of these media-elements is presented as a "field" of "active" potential-meaning. The nature of this "emergence" can be experienced in a sensual manner by the *vuser* of the techno-poetic mechanism. It is the interaction between a *vuser* and a system that has been loaded with specific media-elements and/or processes, that forms a particular time-based dynamic, which in turn becomes generative and emergent. Eco expands on this metaphor of the molecular in his book, *A Theory of Semiotics*:

Properly speaking there are not signs, but only sign functions...A sign function is realised when two sign functives (expression and content) enter into mutual correlation, the same functive can also enter into another correlation, thus becoming a different functive and therefore giving rise to a new sign-function.

... The classical notion of the sign dissolves into a highly complex network of changing relationships. Semiotics suggests a sort of molecular landscape in which we are accustomed to recognize as everyday forms turn out to be the result of a chemical aggregation and so-called "things" are only the surface appearance assumed by an underlying network of more elementary units. (Eco, 1979a, p.49)

This "network of more elementary units" is housed in the menu system. Alternate juxtaposition and interpenetration of media-elements can shift the conveyance of chosen media. Meaning arises based on what the observer of the situation brings to the environment, through the individual perception of an on-going *summing of meaning forces*. This is both exciting because it opens up new avenues of poetic exploration, but it is problematic because there is no unified critical approach to address the complex set

of relative conveyances that are exemplified over time, within the techno-poetic mechanism. Aspects of Pragmatics² can be applied to an initial observation of the environment.

Deleuze and Guattari, in *A Thousand Plateaus*, state that : "All becomings are already molecular" and "Becoming is to emit particles that take on certain relations of movement and rest because they enter a particular zone or proximity." (Deleuze and Guattari, 1987, pp.272-273). The techno-poetic mechanism is generative of shifting zones of relational proximity. Hence, the techno-poetic mechanism presents an environment for the "mindfully aware" (Varela, Thompson, and Rosche, 1991) observation of emergence. The techno-poetic mechanism functions as a device which grounds philosophical concepts through experiential use. Varela, Thompson and Rosche pose the following observation about a related experiential methodology, from the perspective of an alternate philosophical tradition:

In the Indian tradition, philosophy never became a purely abstract occupation. It was tied ("yoked," as is traditionally said) to specific disciplined methods for knowing — different methods of meditation. In particular, within the Buddhist tradition, the method of mindfulness was considered fundamental. Mindfulness means that the mind is present in embodied everyday experience; mindfulness techniques are designed to lead the mind back from its theories and preoccupations, back from the abstract attitude, to the situation of one's experience itself. (Varela, Thompson and Rosche, 1991, p.22)

The dynamic nature of proximity, as it drives qualities of conveyance, is made manifest within the techno-poetic mechanism by means of an on-going, mutable set of processes in virtual space. The space becomes differently evocative and thus poly-connotational. Emergent meaning is a by-product of the unfixity of the "recombinant " sign as experienced within this electronic context. We can observe this recombinant poetic art work as a meaning continuum, exhibiting a fluid, shifting, continuous state of becoming in terms of the production of meaning. Roy Ascott presented a description of the potentials of a related "cybernetic" behavioural environment:

This cybernetic process of retraction generates a constant stream of new and unfamiliar relationships, associative links and concepts. Each art work becomes a sort of behavioural Tarot pack, presenting coordinates that can be endlessly reshuffled by the spectator, always to produce meaning. This is achieved principally in one of two ways; either the artifact has a definitive form but contains only a small amount of low-definition information; or its physical structure is such that its individual constituent parts can change their relationships, either by the direct manipulation of the spectator, or by his shifting view point or by the agency of electrical or other natural power... deep involvement and interplay produces information. The "set" of the art work has variety only in so far as the observer participates. The variety of the set is a measure of the uncertainty involved. An important characteristic of Modern Art,

[read contemporary, emphasis Seaman] then, is that it offers a high degree of uncertainty and creates a great intensity of participation. (Ascott, 1966, p.2)

In my techno-poetic work, content arises through the combination of media-elements encountered by a *vuser* during poetic construction, navigation, time-based change, alternate juxtaposition, behavioural relations, processes of editing and abstraction and through subsequent contemplation of the work. It is sometimes long after encountering a work that the subtlety of certain perceptions arise due to the complexity of the experience.

The techno-poetic environment presents a series of states in terms of the production of experience, including a construction-state where the menu is *blown up* so that the *vuser* can get a close look at this collection of media-elements, a second construction-state (the menu is presented at the bottom of the screen) and a third state where the menu system is removed. It is important to examine here Deleuze and Guattari's notion of "smooth and striated space:"

No sooner do we note a simple opposition between two kinds of space than we must indicate a much more complex difference by virtue of which the successive terms of the oppositions fail to coincide entirely. And no sooner have we done that than we must remind ourselves that the two spaces in fact exist only in mixture: smooth space is constantly being translated, traversed into a striated space; striated space is constantly being reversed, returned to a smooth space. (Deleuze and Guattari, 1987, p.474)

In terms of my techno-poetic mechanism, the menu of rotating wheels can be seen as a literal, "striated" space presenting a grid-like modular system of media-variables. When the choice of media-element is made, the *vuser* makes a spatial montage-like transition. Out of this system arises the "smooth" virtual space — the *plateau* space — which is the virtual site where derived combinations are housed and explored. The smooth space is paradoxically antithetical to the cut of Eisensteinian montage, but like montage it enables the dynamic spatial juxtaposition of particular media-material. Thought enables the internalised intermingling of juxtapositions, initiated by the striated space of the filmic cut or by the smooth space of the virtual plateau.

In *A Thousand Plateaus*, Deleuze and Guattari describe an organism-like system, functioning as follows:

One side of a machinic assemblage faces the strata, which doubtless makes it a kind of organism, or signifying totality, or determination attributable to a subject; it also has a side facing a *body without organs*, which is continually dismantling the organism, causing asignifying particles or pure intensities to

pass and circulate and attributing to itself subjects that it leaves with nothing more than a name as a trace of an intensity. (Deleuze and Guattari, 1987, p.4)

If one looks at the techno-poetic mechanism as a literalising of Deleuze and Guattari's concept of the "machinic assemblage," (Deleuze and Guattari, 1987, p.145) one can "name" and talk about aspects of emergent behaviour or document the actual arising of this behaviour through video and other digital forms. Within this environment, the former emergence is subsumed in present and future emergences, as well as made temporarily null, as one meaning state, with the return of the space to an empty *plateau*. The null state becomes mixed with other time-based meaning-states.

The *vuser* takes an active role in the "deterritorialization" (Deleuze and Guattari, 1987, p.141) of elements in my techno-poetic mechanism, enabling an experiential focus to come to the fore. In the computer, the system of authorship with the system or technology which houses that system of authorship mingles. In computer-based interactive art work, a *vuser* can intermingle with the operative elements of the system through "authored" feedback mechanisms. This gives the *vuser* a chance to enter into a conceptual interrelation with the "artefacts of thought" which the initial author/programmer has encoded in the system. A vigorous inter-authorship is made possible. The qualities of inter-authorship take on different potential levels in relation to the "loading" of the system by the initial author.³ There is a delicate balance to be addressed in computer-mediated authorship, related to that which the initial author embues in the system in terms of content and that which the *vuser* contributes in terms of their input. Perry Hoberman states:

In interactive art, we can find two seemingly opposite tendencies in the approaches to interaction: on the one hand a sharing (or even an abdication) of responsibility (or intentionality) on the part of the author; and on the other, a remarkable extension of the author's domain, an unprecedented attempt to control his/her audience and their response on every level. (Leopoldseder, 1996, p.53)

The device created for this project seeks to be an enabling technology, in the sense that it puts the immensely complex operation of authoring an emergent virtual world into the hands of a participant, who, once acclimated to the system, can intuitively construct and navigate within this generative virtual environment. I have sought to load the system with specific media-elements whose initial authorship has been informed through transdisciplinary research, further enabling the potentials and probability of the generation of *resonant* emergent content. I have attempted to provide the *vuser* of the system complete freedom in terms of individual use of the media-elements in the construction of a virtual world. I hope that the *vuser* becomes highly engaged in a

process of inter-authorship in the environment I have deliberately created in which the *vuser* is empowered. I have sought to populate the system with specific modular media-building-blocks for the *vuser* to operate. The media-collection enables specific fields of content to be entertained through alternate use. These media-elements function as a form of *constraint* within the system — in part, by heightening the probability of emergent resonant media-inter-relations. As stated earlier, the menu system itself is a context and carries artistic content, as does the text included in the menu. This context forms one set of foci in this recombinant poetic work. The result is that all these processes contribute to the construction of a potentially emergent evocative experience.

A related interest in "recombinant " emergent structures is that the "recombinant architecture" of William Mitchell. (Mitchell, 1995, p.47) John Frazer, an architect exploring a-life techniques, discussed the "recombinant architecture" of William Mitchell in his book *An Evolutionary Architecture*. (Frazer, 1995, p.14) Frazer intimated to me in conversation⁴ that exploring emergent forms of architecture in computer-based environments — as derived through "recombinant " relations — is in fact qualitatively different to the emergence that characterises a-life systems. Before our conversation he textually articulated that combinatorial forms are not emergent in the same way that a-life generated forms are:

Mitchell regards architectural design as a special kind of problem-solving process. This approach has limitations which he recognizes in principle. First, it assumes we can construct some kind of representation which can achieve different states that can be searched through for permutations corresponding to some specified criterion (the criterion of the problem). Unfortunately for this goal-directed approach, it is notoriously difficult to describe architecture in these terms, except in the very limited sense of an architectural brief to which there are endless potential solutions. The other problem is that any serious system will generate an almost unmanageable quality of permutations. (Frazer, 1995, pp.14-15)

I share many of the same background interests as Mitchell.⁵ I sought out Frazer and in our discussions about my project, he belatedly agreed that computer-based recombinant strategies (as characterised by my techno-poetic mechanism) could, in fact, produce emergent environments. His view was that this form of emergence represented an alternate strand to the definition of emergence; that in fact a-life⁶ mechanisms exhibited a qualitatively different form of emergence. My techno-poetic mechanism seeks to explore the permutation of a specific set of media-variables, to solve the problem in the abstract: Can an artist produce a generative virtual environment where emergent meaning could be examined and explored through interaction within that environment? Unlike Frazer, I am interested in non-closed systems — the near infinite permutability of specific media-elements as derived within a specific generative virtual environment.

Frazer, exploring generative computer-based architectures, made the following observation about "generative systems:"

An essential part of this evolutionary model is some form of generative technique. Again this is an area charged with problems and controversy. The history of generative systems is summarized by William Mitchell who maps a line from Aristotle to Lull through the parodies of Swift and Borges. After tracing back the use of generative systems in architectural design to Leonardo's study of centrally planned churches and Durand *Précis Des Leçon D'Architecture*, he outlines the concept of "shape grammars" or elemental combinatory systems.

From our point of view, there are several problems with this approach. All of these systems are essentially combinatorial. A problem which seems to stem from Aristotle's description of Nature in terms of a kit of parts that can be combined to furnish many varieties of animals as there are combinations of parts. Fortunately nature is not actually constrained by the limitations implied by Aristotle. (Frazer, 1995, p.14)

Frazer sees problems with this approach, but I am interested in the fertile history elucidated by Mitchell, as well as the "genetic" metaphor which Frazer is curiously dismissing, considering that he explores "genetic algorithms" in his own work. I share many of the same historical interests as outlined by Mitchell in his book *Computer Aided Architectural Design*⁷ (Mitchell, 1979, p.30) approaching these concepts through a poetic conceptual filter. My theory of recombinant poetics has a very different focus to that of Mitchell's "recombinant architecture," introduced in his book *City of Bits*. (Mitchell, 1995) In particular, I am exploring a broader range of media, although I do understand how the techno-poetic mechanism could be used to explore an architectural⁸ approach.

The question of emergence may be approached by enfolding different procedural modalities within the techno-poetic mechanism. There is no true starting place in the techno-poetic mechanism. A *vuser* can enter a work at any *media location* — a media location can be defined as any proximity, either presented through the menu system or through a generated constellation of media elements on the plateau. One *vuser* simply replaces another *vuser* within the environment or starts up the system and continues or begins again. This beginning brings the *vuser* into the menu system which, functions as a vehicle of content. Already the *vuser* is in the *thick of things*, even before construction.

There is no end point in my techno-poetic virtual space. A *vuser* simply chooses to leave an ongoing emergent process, producing a state of non-closure in the work. The *vuser* can choose to clear a particular world; meaning is again accretive. The work is non-hierarchical and non-linear. It exists in a perpetual state of emergence. I visualise

the techno-poetic mechanism as a meaning-continuum exhibiting fluid, shifting states of becoming, where meaning is always emergent. The techno-poetic art work enables the ongoing examination of operative processes as well as the evocative qualities exhibited by media-elements, exemplifying the application of those processes. The *vuser* takes an active role in this generative process, both through physical and psychological interaction.

1 See the section on *Wittgenstein* for an explanation of the relevance of his concept the "meaning of the word is its use in language" (Wittgenstein, 1953, p.20) [note #43, emphasis Seaman].

2 See the section entitled "A Methodology Informed by Pragmatics."

3 See the chapter on "Specific Ambiguity" and the chapter dealing with "Puns".

4 Conversation between Seaman and Frazer, Hong Kong, 1998

5 See also (Mitchell, 1977, p.30).

6 An initial plan for *The World Generator/The Engine of Desire*, called for the introduction of media-elements exhibiting a-life (artificial-life) behaviours. At this time there are no a-life media-elements authored into the techno-poetic mechanism, but it is hoped that a future iteration of the system will include these computer-based media-processes, conflating two different forms of emergence.

7 I have worked on a related set of concerns as those of Mitchell, drawing from a similar history, initially unaware of his interests until reading *City of Bits*. I began to explore interactive combinatorial-media systems, working on one of the first interactive art videodisc projects at the MIT film/video section in 1983. Before this, in 1981, I wrote and performed a poem/musical work called *.apt.alt.* that is particularly relevant to this discussion in terms of the molecular metaphor. The text used a set of words, each of which enfolded an abbreviation from the "Periodic Table of Elements" as the beginning letters of that particular word. This system was an early example of my interest in algorithmic/poetic media-construction. I will speak in detail about the topic of algorithmic construction and conceptual machines in the chapter entitled "Background Surveys: Approaches to Emergent Meaning as Explored Through Various Aesthetic, Philosophical and/or Generative Methodologies." The concept I was exploring in *.apt.alt.* was the following: Any "compound" could be used to derive a new poetic text based on repeating the words of the poem the amount of times suggested in the chemical formula. The formalism of the periodic table, an "elemental combinatory system," could be used as a generative rule base. I was, of course, interested in the fact that *The Periodic Table* itself is a generative system of extreme importance, because it represents the building blocks of matter.

8 In the chapter entitled "Future Research" I outline a series of alternate potential for the techno-poetic mechanism. Architectural design employing the system is one of these potentials.

1.2.2 Variable Levels of Abstraction

A highly abstract virtual world can be generated using the techno-poetic mechanism. In using the techno-poetic mechanism to build virtual worlds, it is possible to draw upon both an *evocative* media-collection of elements as well as media-processes that enable us to act upon that collection. In *Reading Images*, Kress talks about "modality configurations" in relation to abstraction. He states:

A painting can reduce naturalism in the way it treats colour, amplify it in the way it treats texture and yet represent its subject in a naturalistic way. It can be abstract in respect of one modality marker, naturalistic in respect of another and sensory in respect of yet another and this allows a multiplicity of possible modality configurations and hence a multiplicity of ways in which artists can

relate to the reality they are depicting and define "reality" in general. (Kress and van Leeuwen, 1996, p.176)

Although technologically created, the images that are generated as a by-product of using the techno-poetic mechanism could be considered to be *painted or constructed with light*, in that they are informed, in part, by painterly histories as well as the history of collage. The techno-poetic mechanism actually enables one to experience shifts in "modality configuration;" the "reality" of the virtual world is emergent. This does not, as Kress and van Leeuwen suggest, seek to be a "naturalistic" environment. Elements are abstracted or altered within the constraints that have been authored into the system. When observed, the media-elements and process, described above, exhibit an assemblage of dynamic meaning forces. Rudolph Arnheim in his book, *Art and Visual Perception: A Psychology of the Creative Eye*, discusses one perspective on the theory of force, from a visual orientation:

The organism is primarily interested in the forces that are active around it — their place, strength, direction... And the perceived impact of forces makes for what we call expression. (Arnheim, 1957, p.365)

Arnheim also states:

To define visual expression as a reflection of human feelings would seem to be misleading on two counts: first, because it makes us ignore the fact that expression has its origin in the perceived pattern and in the reaction of the brain field of vision to this pattern; second, because such a description unduly limits the range of what can be expressed. We found as the basis of expression a configuration of forces. Such a configuration interests us because it is significant not only for the object in whose image it appears, but for the physical and mental world in general. Motifs like rising and falling, dominance and submission, weakness and strength, harmony and discord, struggle and conformance, underlie all existence. (Arnheim, 1957, p.368)

I am endeavouring to point to the complex emergent pattern that arises out of the use of the techno-poetic mechanism. I seek to move beyond observing these forces as simple dualistic oppositions. It might be said that each category of media-element exhibits its own variety of force-functionality. It is the interpenetration of these varying forces which convey meaning to the *vuser*, whether formal, conceptual, emotive or highly abstract.

In the forthcoming work "Peirce and Psychopragmatics: Semiosis and Performativity," Angela Moorjani points out a series of "trichotomies of interpretants" that could be seen as relevant to the nature of meaning within the techno-poetic environment:

For a discussion of psychic semiosis, the most useful is the triadic division into "emotional," "energetic," and "logical" interpretants. A division which corresponds to the Peircian categories of firstness, or feeling; secondness or action and thirdness or law. (Moorjani, [date not set - forthcoming, p.3 [draft given to Seaman])¹

We could say that the abstraction generated within the virtual environment could be seen in terms of its evocative nature, to act upon the "emotional" state or "feeling" of the observer. It could also be seen as generating an "energetic" or action-oriented interpretant. The expressive nature of this changing pattern within the environment is both a product of the *vuser's* interaction with the system and a product of the elements and processes that have been authored into the device. The environment can be seen to be differently expressive, emotive and/or evocative in relation to the choices of the *vuser*. This pattern is not only pictorial. It is a pattern that conflates the language-vehicles of text, image and music/sound, producing a range of differing suggestive forces. The emergent nature of the environment suggests that the meaning conveyed is, appropriately, never fixed.

¹ See the forthcoming, Moorjani in *Peirce and Psychopragmatics: Semiosis and Performativity*, ed. John P. Muller and Joseph Brent. Baltimore: John Hopkins University Press

1.2.3 A Shifting Set of Aesthetic Juxtapositions of Media-Elements¹

The techno-poetic mechanism seeks to render certain problematics of language-vehicle use, within the frame of an environmental techno-poetic context. Varying qualities of language may be encountered in the frame, relating to natural language — as when the *vuser* of the system converses with other networked *vusers* — and "symbolic" machinic computer language (operating in a hidden mode, under the surface of the experience) and the frame includes "poetic" text exploration — enabled by the menu system, and as well the *languages* of music and visual imagery. These conflated language-vehicles should always be considered in relation to overall environmental relations, the summed abstract *force* of the inter-evocation of all media-elements as understood through what the *vuser* of the work brings to the environment depending on their particular mind-set and behaviour. This view, seeing the techno-poetic mechanism as a new form of language-vehicle exploration, relates to the proto-writing of Derrida (Derrida, 1974, p.9), and must be considered in juxtaposition to the alternate perspective of Deleuze and Guattari (Deleuze and Guattari, 1987, p.147), where they would describe this environment as a mixed-semiotic space and not as a new form of language system. I have provided the concept of fields of meaning (above) as a means to potentially intersect these two perspectives.

By *loading* the techno-poetic mechanism with specific qualities of media, I embrace the mindful exploration and relevance of nonsense and play as well as logic and sense. This is central to the *poetics* of the techno-poetic mechanism. I seek to examine through both discursive and technological means the very peripheries of meaning — environments where the complexities of meaning can be experientially engaged. The poetic nature of the technological environment might be seen as problematic in terms of the potential relevance of the device as a discourse mechanism. Nonsense relations can present seemingly off-kilter juxtapositions, providing the vuser with an experience akin to surrealism. Lautréamont's definition of surrealist beauty — "beautiful as the unexpected meeting, on a dissection table, of a sewing machine and an umbrella," (Waldberg, 1965) — describes an experience engendered through a unique juxtaposition of elements not unlike relations encountered within the techno-poetic environment. Stewart in *Nonsense: Aspects of Intertextuality in Folklore and Literature*: traces the intentional employment of nonsense as a contrasting critique of sense:

... common sense is dependent upon other domains of reality for its ongoing nature. This borrowing takes place not only because of the interpenetration of art and society on an abstract level, but also because the flow of experience in our everyday lives is continually reframed, re accomplished, transgressed and reified as we use the generic forms available to us at any given point in social time... In this is the profound ring of Jacques Ehrmann's point that "the distinguishing characteristic of reality is that it is played." (Stewart, 1978, p.40)²

It is this playful, poignant, intentional exploration of "reframing" that my recombinant poetic work seeks to both point at through engagement, and utilise as a specific aesthetic strategy. The artificial realities that the computer can engender are extremely complex and these worlds are inter-authored through the active participation of the *vuser*. Stewart continues discussing the relevance of nonsense in literature:

The reader of Joyce, Beckett, Cortázar, Nabokov, Borges, or Swift does not explore the casual relations obtaining between events in a sequence so much as wanders between lines, along margins, exploring a discontinuous surface of language unfolding in space. Similarly, the surrealists fascination with film was a fascination with free association, with unexpected visual juxtapositions and the ability to arrange concrete images in an order at odds with that of conventional spatial and temporal reality. (Stewart, 1978, p.152)

Although my recombinant poetic work explores media-elements, many of the above authors referenced here have informed the strategies for the generation of the techno-poetic mechanism as an art work. The description of a "discontinuous surface of language in space," is realised as a computer-based virtual space within the techno-

poetic mechanism. Surrealist film, in its charged employment of juxtaposition can also be seen as informing this space. I will further discuss many of the above authors in the chapter entitled "A Survey of Relevant Literary, Philosophical and Artistic Approaches." I will also explore the importance of "Nonsense Logic."

1 I will later, at length, discuss Eisenstein's importance to the project in relation to dynamic juxtaposition of media-elements.

2 See Ehrmann, 1968, p.56.

1.2.4 The Dissolution of Meaning as One Potential State of Meaning

The techno-poetic device enables the exploration of numerous states of meaning during time-based use. These states include meanings that arise as a result of the examination of non-sequiturs, odd juxtapositions of media-elements, fragmented language, nonsense, complex intertwined poetic text, a view of the empty *plateau*, etc. These kinds of relations, fragmented and nonsensical, might in other contexts be seen as meaningless or a hindrance to meaning. It might further be suggested that an environment characterised by relations of this kind goes against the generation of emergent meaning; in fact an environment of this kind might be read as positing a dissolution of meaning. I again, here, invoke Peirce's definition of the sign. (Peirce, 1931, p.171) If we extend this to an environment that contains a multiplicity or constellation of signs, and suggest that meaning is that which the constellation of signs "conveys" to the mind of the *vuser*, the state of dissolution is also evocative or in other words, becomes meaningful as one focus during a movement through time. Situations which resist interpretation can in fact potentially evoke polyvalent readings¹. It is a human trait to seek meaning within experience. In describing the power of montage Béla Balázs in his book *Der Geist des Films* (1930), (as quoted by Metz in *Film Language*), suggests the following:

One presupposes an intention ... The viewer understands what he thinks montage wants him to understand. Images ... are... linked together... internally through the inevitable induction of a current of signification... the power [of montage, emphasis Metz] exists and is exerted, whether one wants it or not. (Metz, 1974a, p.47)

I do not lament this "exerted" "power" or what I have described as a summing of meaning-forces. For me, it is this kind of "power" that propels contemporary poetics. I am exploring mechanisms of juxtaposition that have a conceptual relation to earlier forms of filmic montage². As the *vuser* moves through different states of meaning brought about through their varying interaction with constructed sign-constellations and

abstractions, including the registering of highly ambiguous configurations of signs, they still experience "a vehicle [or vehicles, emphasis Seaman] conveying into the mind something from without." (Peirce, 1931, p.171) Each of these states can contribute to the construction of an experience of emergent meaning. The failings or fringes of meaning, observed in this mutable environment, can paradoxically be seen as meaningful, in that they serve as one territory in an ongoing set of meaning processes. They may, at times, subtly alter the meaning, not unlike the way a word can have an intonation, delicately shifting the reading of that word³. Annette Michelson, when talking about new forms of art practice that seek to explore an absolute form of palpable presence, makes the following observation:

The word itself, that supreme semantic sign, aspires to concreteness, an immediacy of presence greater than any purely linguistic concept affords. Henceforth the application of the classical Saussurian linguistic model will do certain violence to art and poetry alike, to their stubborn resistance to meaning and their desire to redefine the possibility of meaning through playfulness and speculation. (Michaelson, 1970, p.52)

It is this kind of pointed play and intuitive speculation that is highly characteristic of my art practice. This strategy is employed in the production of certain Dada and Surrealist works. In particular, we can observe a series of works where artists have explored fascinating juxtapositions of words and images. John Welchman in the *Dada & Surrealist Word-Image* makes this observation:

...it is important that there is always a residue of meaning after even the grandest gesture of absurdity or dissolution. It arises from the irrepressible tendency of the word (or word fragment) to begin to signify. Once begun, this signification is governed by institutions and social structures (events, publications, reproductions) in which it originates and to which it moves (particular audiences and readers). There is therefore always meaning-signification- in the Dada and Surrealist Word-Image, though there may not always be an immediately identifiable or legible order in either image, text or sound: part of the effect of Dada words and images, then, is to be found in what Tzara called "the collective madness of sonorous pleasure." (Welchman, 1989, p.45)

It is at times a related "residue of meaning" that contributes to the generation of emergent meaning within the techno-poetic mechanism. I will suggest, along with text, that both sonic aspects and other visual media-elements provide potential "residues of meaning." This is particularly true because the media-elements have been chosen from a menu system as initially unadulterated items, readymade⁴ digital-media, before being placed within the *plateau* space and conflated. The perception of direct or more easily interpreted states of meaning becomes enfolded with the perception of media-elements which resist easy interpretation, as well as with the observation of abstracted media-elements that have arisen through construction processes. These differing states of

conveyance accumulate in the memory of the *vuser* and contribute to the accretive nature of the environment. Welshman goes on to say:

The tension in the activities of Dada and Surrealism (activities that were as much "gestures" or "performances" as they were texts, or images, or text/images) was played out between several polarities: order and disorder, rationality and irrationality, reference and non-reference. A common tendency of much Dada practice was the similarly predicated struggle of many artists and writers associated with the movement to coordinate the dissolution of offensive naturalistic visual and linguistic codes with another order, originating elsewhere: in the unconscious, the intratextual (and intertextual) orders of language, or in unseen mystical, spiritual, or alchemical domains. (Welshman, p.78, 1989)

A examination of the "mystical"⁵, "spiritual" and "alchemical" readings of the techno-poetic device fall outside of the scope of this dissertation. The aesthetic characteristic of the virtual space of techno-poetic mechanism has been informed by Dada and Surrealist practice⁶. This virtual space also explores the dissolution of a contemporary form of naturalism often witnessed in virtual environments created for military or industrial applications. The environment is always performative and at times explores the gestural. I have spoken at length about the notion of "Fields of Meaning," pointing to the relevance of observing my environment in terms of meaning-forces, extending beyond the notion of simple polarities like "order and disorder, rationality and irrationality, reference and non-reference." We could say that the *vuser* cycles through differing states which have these polarities as their extreme. In *The Order of Things*, Foucault defines two terms that are descriptive of certain states of meaning as potentially found in the techno-poetic environment:

Utopias afford consolation: although they have no real locality there is never the less a fantastic, untroubled region in which they are able to unfold; they open up cities with vast avenues, superbly planted gardens, countries where life is easy, even though the road to them is chimerical. Heterotopias are disturbing, probably because they secretly undermine language, because they make it impossible to name this and that, because they shatter or tangle common names, because they destroy syntax in advance and not only the syntax with which we construct sentences, but also the less apparent syntax which causes words and things to "hang together." (Foucault, 1970, p.48)

The techno-poetic mechanism, as it creates shifting territories of sign-configurations, enables movement temporarily across both "utopian" and "heterotropic" constructed virtual-vicinities⁷. These fabricated cyber-vicinities, when viewed as momentary territories in an environment that is predicated on unfixity, can later be subsumed as individual states of meaning within an environment that enables the construction and perusal of many volatile meaning-states. The techno-poetic mechanism enables the engagement of interactive observation of language-vehicles as a temporary map,

potentially enfolding the perceptions of both Heterotopian and Utopian spaces, in a time-based environmental engagement with emergent meaning.

- 1 I will elaborate on this in the section entitled "Nonsense Logic."
- 2 See the chapter on "Eisenstein: Montage."
- 3 This metaphor of intonation was suggested by Marcos Novak during a discussion on the nature of meaning in virtual environments.
- 4 Duchamp's notion of the "readymade" (Duchamp, 1989, p.141) explores aesthetic indifference, and is interesting in the light of the aesthetic potential of these elements.
- 5 See "Mystical Systems, Procedural Art and the Computer. " (Zweig, 1997)
- 6 See the chapter "A Survey of Relevant Literary, Philosophical and Artistic Approaches."
- 7 See the translator's introduction by Harkness in (Foucault, 1983, p.5) where he articulates these two kinds of space.

1.2.5 A Passing and/or Circulation of Intensities — Deleuze and Guattari

The movement through differing configurations of signs promotes a passing and/or circulation of "intensities." The concept of the "Body Without Organs" or "BwO" of Deleuze and Guattari, as developed in *A Thousand Plateaus* is relevant here:

A Body Without Organs is made in such a way that it can be occupied, populated only by intensities. Only intensities pass and circulate. Still, the BwO is not a scene, a place, or even a support upon which something comes to pass. It has nothing to do with phantasy, there is nothing to interpret. The BwO causes intensities to pass; it produces and distributes them in a *spatium* that is itself intensive, lacking extension. It is not space nor is it in space; it is matter that occupies space to a given degree-to the degree corresponding to the intensities produced. It is nonstratified, unformed, intense matter, the matrix of intensity, intensity = 0; but there is nothing negative about that zero, there are no negative or opposite intensities. Matter equals energy. Production of the real as an intensive magnitude starting at zero. (Deleuze and Guattari, 1987, p.153)

The potentialities of recombinant poetic processes are reflected in the *spatium* that examines the relation between the sensations of the *vuser* of the techno/poetic mechanism and the realm of their interactive engagement. Each interaction promotes a vibration of "intensity" in the body of the participant. The subtitle of the work, *The Engine of Desire*, points at this realm of "intensities" in terms of desire. Choices and actions are a reflection of a summing of these stimulated "intensities." It is also the nature of these intensities and the actions that follow from them, that in turn defines the emergent quality of the technological environment.

Brian Massumi, the translator for *A Thousand Plateaus*, further describes the "Body without Organs," by no means a simple concept to elucidate:

Call it a "body": an endless weaving together of singular states, each of which is an integration of one or more impulses. Call each of the body's different vibratory regions a "zone of intensity." Look at the zone of intensity from the point of view of the actions it produces. From that perspective call it an "organ." Look at it again from the point of view of the organ's favorite actions and call it an "erogenous zone." Imagine the body is in suspended animation: intensity = 0. Call that the "body without organs." Think of the body without organs as the body outside any determinate state, poised for any action in its repertory; this is the body in terms of its potential, or virtuality. Now freeze it as it passes through a threshold state on the way from one determinate state to another. That is a degree of intensity of a "body without organs." (Massumi, 1992, p.70)

We could say that the *vuser* experiences a multiplicity of "pure intensities" while engaged with the techno-poetic mechanism. Pure intensities, in this instance, are propagated by a confluence of matter and energy processes. To some extent, these "intensities" are conveyed through energy directly — energy characterised by light and sound. On an underlying level energy is manifested in the form of computer code (artefacts of thought processes) . I see this as relating to the equation "matter equals energy." The intensities are also set in motion through the "matter" or hardware of the computer as well as through physical interface devices. It is the entirety of these intensities, as registered in the body of the *vuser*, that defines this "matrix of intensities" in this particular "Body Without Organs." The "real" in this case is constructed of media-elements, hardware and software — the authored and inter-authored techno-poetic environment. The human registering of these "intensities" within the body's "zones of intensity," (and the actions which are stimulated by these intensities) reflect the palpable, behavioural nature of this virtual space.

Roy Ascott elucidates a set of behavioural relations in *Behaviourist Art and the Cybernetic Vision*:

Art as:

a behaviour analogue;

a behavioural trigger;

a behavioural environment;

a behavioural structure;

a behavioural ritual;

a total behavioural synthesis. (Ascott, 1966, p.5)

"Behavioural synthesis" is central to the operational dynamic that I seek to make technologically operative through the techno-poetic mechanism. The generative virtual environment is a space propagated through matter/energy flows, conflating physical hardware, *vuser* and generative virtual space. Manuel De Landa in *A Thousand Years of Nonlinear History* suggests the following about the concept of the "Body Without Organs" or BwO and the concept of "abstract machines:"

The concept of the BwO was created in an effort to conceive the genesis of form (in geological, biological and cultural structures) as related exclusively to immanent capabilities of the flows of matter energy information and not to any transcendent factor, whether platonic or divine. To explain this morphogenetic potential without sneaking transcendental essences through the back door, Deleuze and Guattari developed their theory of abstract machines, engineering diagrams defining the structure generating processes that give rise to more or less permanent forms but are not unique to those forms; that is they do not represent (as an essence does) that which defines the identity of those forms. (De Landa, 1998, p.263)

The techno-poetic mechanism functions as an organism¹ like, self-organising system. It simultaneously functions as an *operative diagram* of its own use. I seek to apply the theory of the "abstract machine" to the examination of this new emergent techno-poetic terrain. Unlike the "more or less permanent form" that De Landa is talking about, I seek to address a specific mutable form. The production of this shifting, ongoing, *poetic* virtual landscape is the emergent by-product of a specific "desiring-machine," wherein the desire of the *vuser* is made manifest through interaction. In *Anti-Oedipus* Deleuze and Guattari discuss the concept of the "desiring machine:"

Desiring-machines are binary machines, obeying a binary law or set of rules governing associations: one machine is always coupled with another. The productive synthesis, the production of production, is inherently connective in nature: "and..." "and then..." this is because there is always a flow-producing machine and another machine connected to it (the breast-the mouth). And because the first machine is in turn connected to another whose flow it interrupts or partially drains off, the binary series is linear in every direction. Desire constantly couples continuous flows and partial objects that are by nature fragmentary and fragmented. Desire causes the current to flow, itself flows in turn and breaks the flows. (Deleuze and Guattari, 1983, p.5)

The World Generator/The Engine of Desire seeks to function as a meta-desiring-machine, a desiring-machine that enables the mindful observation of its own operation. The user of the system engages with the interface, making specific choices in relation to media-elements and processes. The energies of engagement bring about a change in the environment, which is communicated as an energy flow of light and sound back to the *vuser*. The construction of the virtual world is a specifically framed "production of

production" which enables the *vuser* to observe processes of meaning production in an experiential manner.

The production that engenders this virtual world does not value text over the language-vehicles of image or sound. I am exploring a cyber-polysemic "multiple-media-element" machine of production. Deleuze and Guattari suggest the following about a complex related sign space:

A regime of signs constitutes a semiotic system. But it appears difficult to analyze semiotic systems in themselves: there is always a form of content that is simultaneously inseparable from and independent of the form of expression and the two forms pertain to assemblages that are not principally linguistic. However, one can proceed as though the formalization of expression were autonomous and self sufficient. Even if that is done, there is such diversity in the forms of expression, such a mixture of these forms, that it is impossible to attach any particular privilege to the form or regime of the "signifier." If we call the signifying semiotic system semiology, then semiology is only one regime of signs among others and not the most important one. Hence the necessity of a return to pragmatics, in which language never has universality in itself, self-sufficient formalization, a general semiology, or metalanguage. Thus it is the study of the signifying regime that first testifies to the inadequacy of linguistic presuppositions and in the very name of regimes of signs. (Deleuze and Guattari, 1987, p.12)

In seeking to examine technological media-environments, the expression is simultaneously "inseparable from and independent of the form of expression." Engagement with the techno-poetic mechanism appears to be quite natural and intuitive, although it is brought about through a complex assemblage of hardware, data-projector, audio amplifier, computer code, media-authorship and the interaction of the *vuser*. The "mixture of forms" that arises out of this complex "machinic" environment transcends the complexities that can be addressed by textual language. I have fused the notion of the "abstract machine" with an operational one — generating a "pragmatic-abstract-machine." Deleuze and Guattari discuss the nature of their notion of the "abstract machine" as related to the linguistic projects of Noam Chomsky:

We must say that the "abstract machine" is necessarily much more than language. When linguists (following Chomsky) rise to the idea of a purely language-based abstract machine, our immediate objection is that their machine, far from being too abstract, is not abstract enough because it is limited to the form of expression and to alleged universals that presuppose language. Abstracting language is an operation that appears all the more relative and inadequate when seen from the viewpoint of abstraction itself. (Deleuze and Guattari, 1987, p.141) [see also (De Landa, 1998, p.218)]

I agree that a purely language-based [read textual] "abstract machine" is not abstract enough to deal with the evocative nature of the techno-poetic mechanism as experienced

by an active *vuser*. We then need to seek new technological means to address and examine communication in virtual environments. Again this statement suggests the necessity of creating a functional technological mechanism exploring shifting environmental media-territories of intermingled signs and non-sign states — a generative, operable, virtual media-environment. By approaching these media elements as language-vehicles through a techno-poetic device, I construct a meta-language-vehicle system to address a particular "inadequacy of linguistic presuppositions." I am paradoxically framing this production through such a linguistic presupposition — that is this linked written narrative.

In *Language* (Kristeva, 1989), Julia Kristeva articulates her position concerning psychoanalysis and language in terms of a related notion of "production." She pointed out that a psychoanalytic approach to language differs greatly to certain linguistic approaches, adding to the complexity of defining "the abstract-machine." Kristeva provides this observation:

Psychoanalysis renders impossible the habit commonly accepted by current linguistics of considering language outside of its realization in discourse, that is, by forgetting that language does not exist outside of the discourse of a subject, or by considering this subject as implicit, as equal to himself, as a fixed unit coinciding with his discourse. (Kristeva, 1989, pp.276-277)

This Cartesian postulate, which underlies the procedure of modern linguistics and which Chomsky brought to life, was shaken up by the Freudian discovery of the unconscious and its logic. From then on it became difficult to talk about a subject without following the various configurations revealed by the different relations between subjects and their discourse. The subject *is* not; he makes and unmakes himself in a complex topology where the other and his discourse are included. One can not talk about the meaning of a discourse without taking this topology into account. (Kristeva, 1989, pp.274 -275)

The techno-poetic mechanism, functioning as a technological discourse mechanism, enables the self-actuated and self conscious experiential observation of this process of meaning production. Kristeva continues discussing her notion:

The subject and meaning are not; they are produced in the discursive work (Freud spoke of the dreamwork). Instead of the flat structure that *La Langue* and its transformational variations constitute for structural linguistics, the psychoanalyst substitutes the problematic of the production of meaning (of the subject that must be discerned theoretically). It is not a production as defined by generative grammar - which doesn't produce anything at all itself (for it doesn't question the subject and meaning) and is content to synthesize a structure in the course of a process that does not for one second question the foundations of that structure. The production of meaning is instead an actual production that traverses the surface of the uttered discourse and that engenders in the enunciation — a new stratum opened up by the analysis of language-a particular meaning with a particular subject. (Kristeva, 1989, pp.274-275)

The Techno-poetic mechanism opens out a rich generative topology which seeks to extend the scope of linguistic observation by including the exploration of what might be considered extra-linguistic vehicles. The "enunciations," or digital inscriptions produced within my mechanism, explore "a new stratum opened up by the analysis of language — a particular meaning with a particular subject" as developed through inter-authorship. In this kind of computer-based production, a complex situation of meaning-generation is played out by the *vuser*.

Returning to a discussion of Chomsky, Hans Hörmann very clearly demonstrates the limits of Chomsky's approach to linguistics. He develops the following reasoning:

...generative linguistics, which originated at the beginning of the 1960's, seemed at that time well suited to provide psychology with those linguistic units and constructs that psycholinguistics must be aware of if it is to clarify the act of language use. A division of labor seemed to present itself: linguistics furnishes the description of language; psycholinguistics employs the terms and theoretical approaches of this description in order to examine the use of language.

Today, more than twenty years later, this view proves to have been a mistake. Linguistics and with it generative linguistics, was exclusively interested in language-in-and-of-itself; it conceived of language as a closed system of signs. The combination of signs, that is syntax, is the focal point of linguistic endeavor. It is only in recent years that a scientific description of language usage (pragmatics) has been added to that of the self contained system-as-such.

For the psycholinguist, however the sign must always be an applied sign, a sign in use. If the basic anthropological characteristic of language is its character as a tool, then this function of language must also be the basis and focal point of the psychology of language. (Hörmann, 1986, p.47)

Unlike the closed system of signs characterised by Chomsky's linguistics, my techno-poetic apparatus seeks to point at the emergent qualities of language use as explored in relation to extra-linguistic media-elements, elements that I am calling language-vehicles. The techno-poetic device explores new environmental forms of syntax through the spatial placement of elements from a media-collection. The mechanism functions as a cyber-linguistic vehicular system, enabling the examination of varied language use within a specific, operative computer-based environment. Any configuration that arises during interaction can be seen as *use*. This evocation does not function through a proper enforced grammar. It sets out to enable an exploration of environmental syntax by functioning as a meta-operational tool.

The techno-poetic mechanism functions as an operational time-based meta-picture generator. We can call the techno-poetic discourse mechanism an "operational" diagram which exhibits a dual functionality of being both an operational map and an electronic territory generator. The device functions as an "operational diagram" making the

mindfully aware operation of the mechanism, a meta-operational engagement. Deleuze and Guattari continue here their discussion of the abstract machine:

A true abstract machine has no way of making a distinction within itself between a plane of expression and a plane of content because it draws a single plane of consistency, which in turn formalizes contents and expressions according to strata and reterritorializations. The abstract machine in itself is destratified, deterritorialized; it has no form of its own (much less substance) and makes no distinction within itself between content and expression, even though outside itself it presides over that distinction and distributes it in strata, domains and territories. An abstract machine is not physical or corporal, any more than it is semiotic; it is diagrammatic (it knows nothing of the distinction between the natural and the artificial). It operates by matter, not by substance; by function, not by form; Substances and forms are of "expression" or of content. But functions are not yet "semiotically" formed and matters are not yet "physically" formed. The abstract machine is pure Matter-Function- a diagram independent of the forms and substances, expressions and contents it will distribute." (Deleuze and Guattari, 1987, p.141)

The visual world that we both generate and explore through the techno-poetic mechanism presents a "a single plane of consistency." Paradoxically, my mechanism, in producing a real-time operational diagram — one that functionally exhibits the outermost qualities of the generation of its own operation, while simultaneously exhibiting itself as the process under observation — becomes a diagram, not unlike the one described above. It seeks to make experiential some elements of Deleuze and Guattari's "abstract machine." While this contradicts their definition it also manifests an example. Using the mechanism itself forms a shifting "territory", directly relational to "the plane of consistency." The user of the system can experience directly - context, decontextualisation and recontextualisation of semiotic elements and associated processes as a pure "Matter-function" brought about through interaction with the mechanism, as an ongoing computer-based feedback mechanism. Elsewhere Deleuze and Guattari state - "matter equals energy." (Deleuze and Guattari, 1987, p.153) Thus the matter/energy flows that enable the propagation of the techno-poetic mechanism could be seen to fit the above description. As stated above, "intensities," as triggered through the observation of the intermingling of media-elements, are propagated by a confluence of matter and energy processes. These processes are brought about within a specific generative computer-based virtual environment. It is the nature of the virtual environment to be engaged (through the conceptual bridging of the real, physical world of human processes and corporeal interaction), with the authored, operable world of virtual-environmental meaning production.

1 See Ashby, 1952, and McCorduck, 1979, p.83.

1.2.6 Environmental Patterns - Environmental "Combinatorial Constraints" and the Notion of "Neighboring" Media Elements

A purely text based "abstract machine" is not abstract enough to reflect the complexity of environmental-media relations characteristic of the techno-poetic mechanism. Are there alternate methodologies that might help us define a more appropriate "abstract machine," or is this also an impossibility? De Landa illuminates a historical/mathematical approach to the problem (although this approach is still limited, a purely text based approach not an "interactive" exploration of media-elements in the techno-poetic mechanism):

In essence, what Deleuze and Guattari oppose [in relation to the theory of generative grammar of Chomsky, emphasis Seaman] is the postulation of a "universal core" (or synchronic dimension) of language, since it relegates social processes (such as pidginization, creolization, or standardization) to a secondary role, affecting at most the transformational component of the grammar. What they propose instead is to give historical processes a more fundamental role by modelling the abstract machine of language not as an automatic mechanism embodied in individual brains but as a diagram governing the dynamics of collective human interaction...

But if a set of rules is not the source of the combinatorial productivity of language, then what is? One possible answer is that words carry with them, as part of their meaning, "combinatorial constraints" that allow them to restrict the kinds of words with which they may be combined. That is, in this view, individual words carry information about their frequency of co-occurrence with other words, so that, as a given word is added to a sentence this information exerts demands on the word or kind of word that may occur next. (De Landa, 1997, pp. 218 & 219)

The techno-poetic mechanism, responding in dynamic inter-relation to the interactivity of the *vuser* (or multiple *vusers* in networked environments) enables engagement with an expanded set of media-elements which in turn enables exploration of a conflation of language-vehicles. The notion that each media-element might hold a particular "combinatorial constraint" in relation to other media-elements reveals another potential perspective onto the project, and we could say that individual words trigger information about "their frequency of co-occurrence with other words." Might it be that words carry information about their frequency and co-occurrence with media-elements in an environmental context? How might environmental "patterns" come to inform these constraints? To what extent does each media-element carry combinatorial constraints based on the accretive memory of past environmental understandings? De Landa continues his discussion of the combinatorial constraint:

The linguist Zellig Harris, who introduced the notion of "transformation" into linguistics in the early 1950's (and so is no stranger to the Chomskyan paradigm), has developed a way to take metaphorical descriptions like this and transform them into a mathematical theory of language that comes very close to the abstract machine we are looking for. According to his theory, the constraints or demands that words place on one another are transmitted as socially obligatory information. "Information" is being used here in the sense of "physical information," the kind measured in bits, not the semantic information used in dictionary definitions. Harris explicitly develops his model of the social transmission of combinatorial constraints (or rather, the sentences constructed with their help) competing for the same "informational niches." (De Landa, 1997, p.219)

As we come to rely on environmental and/or spatial transmission of information, as exemplified by virtual environments, we must seek to understand the nature of environmental "combinatorial constraints." In *Semiotics of Visual Language*, Saint-Martin speaks about the relevance of "neighboring," which is central to the production of meaning in a virtual environment:

The relationship of neighboring is the most important topological notion by which the function of continuity is constructed in any spatial field, whether physical or perceptual. Its importance to physical sciences was underlined by Bachelard¹ when he stated that any force in the continuity of the field "presents itself as determined by the condition of neighboring. The term, vague in everyday language, acquires all of the desirable conciseness in mathematical expressions." (Saint-Martin, 1990, p.69)

Thus, Bachelard also points toward "neighboring" as being central to an enlarged understanding of topological space. It is the set of underlying "mathematical expressions," that characterises virtual space, which in turn enables the operative exploration of media-elements. I can not help but see a theory of topological /environmental pattern-based "combinatorial constraints" as related to "neighboring" media-elements as a potential future realm of inquiry. The poetics of virtual space pushes the boundaries of what might constitute "neighboring" media-material. Virtual environments enable the authorship of realms that potentially have little to do with the physics and/or normal constraints of non-computer-based environments. Any process that can be abstracted through computer code and made operative, as earlier described by Lovelace in terms of the *analytical engine*, can be functionally enfolded within a virtual environment. In time, the emergent nature of virtual environments may expand and/or explode the quantification of these combinatorial constraints, changing the way we come to understand the vast diversity of experience through the potential unfixity characteristic of a virtual-environmental perception of context. Saint-Martin discusses discontinuity as arising from perception:

For semiotics of the visual language, discontinuity is a primal occurrence arising from perception itself, given the multiplicity of heterogenous stimuli

encountered; it also arises from the logical levels where semiotics is assumed to operate as a science explaining effects by causes: "Any casual phenomenology is necessarily discontinuous because one speaks of an effect that follows a cause only for an effect that *differs* from the cause."² (Saint-Martin, 1990, p.71)

Certainly this again points to the potentials of difference [différance] (Derrida, 1976, p.23) in the generation of emergent meaning, as earlier discussed in relation to Derrida. It again points to the "pataphysical" (Jarry, 1965) nature of the environment because cause/effect relations are authored in virtual space.

1 See Bachelard, 1951, *L'Activité Rationaliste de la Physique Contemporaine*. Paris: Presses Universitaires de France, P.6.

2 See Bachelard, 1951, *L'Activité Rationaliste de la Physique Contemporaine*. Paris: Presses Universitaires de France, P.206.

1.2.7 An Expanse of Usage: From Wittgenstein's — "The Meaning of the Word is its Use in Language" to the "Machinic Assemblage" of Deleuze and Guattari

Central to the techno-poetic discourse mechanism is the observation of the construction of context through the use of an authored system. In particular the engagement with emergent meaning in a mutable context is derived as a product of computer-based construction and navigation, as well as interaction with other processes I have cited. Deleuze and Guattari speak of the "production of production" (Deleuze and Guattari, 1983, p.5) When this notion is joined to their notion of the "machinic assemblage" (Deleuze and Guattari, 1987, pp.330-331) it is possible to begin to elucidate concepts central to my project. The authors here describe their concept of the mixed-semiotic "machinic statement" or "enunciation":

What we term machinic is precisely this synthesis of heterogeneities as such. Inasmuch as these heterogeneities are matters of expression, we say that their synthesis itself, their consistency or capture, forms a properly machinic "statement" or "enunciation." The varying relations into which a color, sound, gesture, movement, or position enters into the same species and in different species, form so many machinic enunciations. (Deleuze and Guattari, 1987, pp. 330 & 331)

Deleuze and Guattari describe an accumulation of the various enfolded modes of the abstract machine as a "machinic assemblage." (Deleuze and Guattari, 1987, p.145) My Techno-poetic mechanism seeks to function as an "operative" meta-machinic assemblage — the *vuser* actively engages with meaning through the exploration of the device. The user of my art work may also *explode* meaning through interaction,

producing an environment of great complexity and, in fact, a series of potential *states* of meaning may be observed during the use of my recombinant poetic system.

Wittgenstein has written in *Philosophical Investigations* observations concerning the "use" of language:

... for a large class of cases — though not for all — in which we employ the word "meaning" it can be defined as thus, the meaning of the word is its use in language. (Wittgenstein, 1953, p.20)

It is within my emergent generative techno-poetic environment that I seek to make an overtly experiential statement enabling alternate contextual comparison as engendered through interaction — the dynamic interactive "use" of media-elements. Wittgenstein goes against the notion of felt meaning in the discussion of pure linguistic logic. In *Philosophical Investigations* he states the following:

The meaning of a word is not the experience one has in hearing or saying it and the sense of a sentence is not a complex of such experiences. (Wittgenstein, 1958, p.181)

I disagree with Wittgenstein where meaning generated in a computer-based environmental context of media-elements is introduced. A simultaneous conflation of the language-vehicles of music or sound and image (both still and moving) and text can evoke a shift in the meaning of a word (or media-context), or play intentionally with its ambiguity. The meaning of a sequence of words can shift based on environmental factors (factors of context). I am interested in how a specific set of conveyances arise out of a mutable context as a product of a generative environmental engagement. Conveyances are formed through the intermingling of fields of potential. The meaning is a product of the summing of the image, music and text, both visual and sonic including vocal intonation. These media-elements function together as an interpenetration of fields; thus forming one environmental field. As Deleuze and Guattari suggest, "There is always a form of content that is simultaneously inseparable from and independent of the form of expression and the two forms pertain to assemblages that are not principally linguistic." (Deleuze and Guattari, 1987, p.12) A computer enables the operative, interactive perusal of digital information¹. The information has particular properties. In my project, the perusal of content is both inherent to the computer and its related optical and sonic technologies. This realm could not be elsewhere fully experienced and is dependent on simultaneous interpenetration of striated levels of system authorship, i.e., computer code, media-elements, computer system, audio system etc..

The scientist Casti, speaking about Wittgenstein and complexity, articulates this relation:

The main claim of Wittgenstein's picture theory is that there must be a link between the logical structure of a given language and the logical structure of a real-world fact that a statement in that language asserts. Since the link is itself a relationship in the real world, it's reasonable to suppose that there is some way to express the character and properties of this link using the grammatical rules of the language. But after years of struggling with exactly how to do this, Wittgenstein came to the conclusion that the link between the real world and its expression in language cannot be "said" at all using language; rather it must be "shown." We can't express everything about language using language itself; somehow we must transcend the boundaries of language. Thus Wittgenstein says that we cannot really speak about the world, but only "point." (Casti, 1994, p.7)

The limitation of textual language suggests the need to author the techno-poetic mechanism; the mechanism can facilitate a form of computer-based *experiential pointing*, through particular forms of language-vehicle use. Reality is more complex than our ability to fully reflect upon it with textual language. I am using, paradoxically, textual language to express this very inability. The question becomes: how can one build a mechanism that best enables reflection on the nature of this complexity? The computer itself is predicated on the language of computer code, functioning in conjunction with operative media-elements and processes that, themselves, function as "language" vehicles. Like textual usage, the media-elements can only "point" at themselves. The environment of the computer enables us to experience differing configurations of these conflated language-vehicles and to reflect upon instances of actual use, albeit use within a specific authored "virtual space." The generative virtual environment functions as a meta-language-vehicle system, observing the nature of emergent meaning.

Where "use" is emergent through the *vuser's* interaction with the system, meaning is that which the "use" conveys to the *vuser*. It is within this emergent generative techno-poetic environment that I seek to make Wittgenstein's statement overtly operational, extending "use" by enabling different contextual comparisons to be brought about through alternate subsequent exploration. Eugene T. Gendlin, in *Experiencing and the Creation of Meaning — A Philosophical and Psychological Approach to The Subjective* describes the notion of "felt meaning." (Gendlin, 1962) In terms of everyday experience he has suggested:

What goes through is much more than what we "have" [explicitly]... any moment is a myriad richness, but rarely do we take the time to "have" it.... Going through a simple act involves an enormous number of familiarities,

learnings, senses for the situation, understandings of life and people, as well as many specifics of the given situation. (Gendlin, 1973b, p.370)

The perception of "felt meaning" is potentially exemplified through experiencing the generative virtual environment. The loading of the fields of meaning presents an enfolded set of potential meanings that one *negotiates* through use. John Welwood, in *The Holographic Paradigm and Other Paradoxes*, further speaks about felt meaning:

Felt meaning can be seen as an experiential manifestation of holographic compression, where many bits of information function all together as a whole... This felt sense is blurry in that it includes all of this implicitly... not focal or sharply defined, but always functions as a global background. When we attend to an implicit felt sense in this way, we are using a scanning type of attention that does not single out specific focal objects one at a time." (Welwood, 1982, pp.128-129)

We may oscillate between felt meaning, using a "scanning" attention and more specific individual meanings, when we focus on particular media-elements. The goal of generating an emergent interactive experience constantly changes our relation to media experience. In a movie, the viewer is often carried along by a specific set of elements: a plot, a fixed narrative, a pre-defined meaningful progression, a climax, and so on. The expectations of experience within my techno-poetic work must be seen as different from other media experiences² and observed in the light of its own explorations and chosen foci. It is central to this research to generate and share new understandings about the complexity of the contemporary world of electronic media, as well as to reflect upon the larger world of *relative* phenomena by observing the manner in which meaning arises and falls away within this relativistic electronic environment.

It is important here to again invoke Wittgenstein's statement "the meaning of the word is its use in language." When we compare Wittgenstein's statement to my project, one can observe an important difference; in the emergent environment of my techno-poetic mechanism, we can observe multiple contexts of "use" of media-elements which arise directly from interaction — the experiential endeavour.

¹ See *The Mathematical Theory of Communication*, (Shannon and Weaver, 1963) on information theory.

² I have chosen generally to not use Deleuze's *Cinema 1* (Deleuze, 1986) and *Cinema 2* (Deleuze, 1989) to articulate media relations in the techno-poetic mechanism in that cinema space is quite different from virtual space in terms of its mutability.

1.2.8 A Methodology Informed by Pragmatics

In the preface to *Mind, Code and Context*, T. Givón provides this definition to "Pragmatics"¹.

Pragmatics is an approach to description, to information processing, thus to the construction, interpretation and communication of experience. At its core lies the notion of *context* and the axiom that reality and/or experience are not absolute fixed entities, but rather *frame-dependent*, contingent upon the observers *perspective*. (Givón, 1989, Preface)

Central to an exploration of emergent meaning is both the experiential and textual examination of mutable context. "Pragmatics" provides another "perspective" relevant to my project. The virtual environment I have created always seeks to explore a conflation of media-elements — to employ methods as developed in the study of pragmatics, an alternate "perspective" informing the task of creating a work of art that examines and explores emergent meaning. As stated, there is a depth to experience that can be difficult to express through textual language. It is this understanding that drives the need to create a functioning techno-poetic mechanism— a mechanism seeking to "extend" language use by functioning as a higher order language or operational semiotic system through the conflation of differing language-vehicles. In the *Journal of Philosophy* the founder of cybernetics, Norbert Wiener presented the following concept:

The notion of the infinite complexity of experience which relativism demands is none other than that which the scientist has long made use of : it is merely the notion of the infinite potential complexity of experience...

He continues:

The relativist believes that everything, in so far as it is understood adequately, is understood in relation to other things, that our analysis need never come to a definite stopping-place. (Wiener, 1985, p.64)

The fact that meaning can always be seen to arise relative to context becomes a focus within electronic media-contexts characterised by mutability. We could say that this concept suggests a logic for the exploration of non-closed systems. This idea is central to my project. The fact that the experiential techno-poetic mechanism is characterised by non-closure is exemplified by the concept that one need not have a "definite stopping-place" in terms of the examination of emergent meaning. When we examine reality closely, we can observe a series of cases in which what had seemed to be a scientific "certainty" turned out to be of no certainty at all. On subsequent examination (or

through additional depth of study and/or advanced technological means), this "certainty" was proven to be false. The following litany, as defined by Hamilton and Bonk, points to some of these cases:

Heisenberg's Uncertainty Principle, Von Neumann's Monte Carlo Method, Gödel's Incompleteness Theorem, The 2nd Law of Thermodynamics and statistical description of matter, Wittgenstein's verdict on the sayable and the sentence. These are all acknowledgements of the limitations of an hermetic cognitive system. (Hamilton and Bonk, 1997, p.310)

From what perspective (or perspectives) — from a set of infinite perspectives, can we address the notion of emergent meaning? If we believe that we are able to only "point at" meaning through language use, can we develop other mechanisms which help us to augment this "pointing?" How can the nature of non-linear, generative systems become relevant to this study of emergent meaning? How is the experience of a generative technological media-environment different from other environments characteristic of communication and intellectual exchange?

In *Mind, Code and Context: Essays in Pragmatics*, T. Givón articulates the following thoughts related to the limits of this research, from the perspective of Pragmatics:

The three core metaphors for the pragmatic method...--point of view, frame, context — [these] may be further generalized via the notions of systems and meta-levels. Let a system be, at its most general, a hierarchic arrangement of parts and sub parts. When one undertakes to specify ('describe') a system, it is desirable, from a purely practical point of view to impose some limit on the description, otherwise the descriptive task may be infinite. This requirement is the one we call closure.

The system, as a hierarchic entity, is made out of a progression of levels, each one acting as a meta-level to the sub levels(s) embedded within it. Each meta-level is thus the context for the sub-levels embedded within it. For purely practical reasons, if the system is to remain finite (i.e. describable within finite time, space and means), the last — highest — of our picture metaphor, the last meta level is the frame, yet itself remains un-framed, therefore not fully specified. And here lies or first predicament of pragmatics, that of completeness:

- 1) "So long as the system is fully specified, i.e. closed, it must remain in principle incomplete."
- 2) So long as one is allowed to switch meta-levels — or points of view — in the middle of a description, the description is logically inconsistent."

(Givón, 1989, p.2)

It is the last two statements that I wish to specifically address in terms of my creation. I will again point out the fact that my generative recombinant poetic system, although composed of a finite number of media variables, is predicated on non-closure. Although the underlying code that enables interaction is hierarchic in nature, the media-elements

made operative within the computer-based system function in a non-hierarchical realm. We are empowered to switch meta-levels or "point(s) of view" in the middle of a "description." In my project the "description" is the "media-world" that is being generated, enabling the exploration of an ongoing interactive process of emergent meaning generation. This is a form of semiotic self-description.

We must remember that the participant is viewing potentially more than one "level" of the system over time. These levels of interaction, become operational resulting from the underlying code that makes the mechanism operative. This electronic circumstance "points toward" how meaning arises in related computer-based situations outside of this system, where one can potentially shift from meta-level to meta-level, from context to context. Givón points out one problem with this situation in terms of logic, as derived from the writings of Bertrand Russell's text concerning constraints on systems:

Russell's Constraint on Systems:

"A self-consistent (though in an obvious sense incomplete) logical description can only operate within a fixed point of view, context, meta-level"... In imposing his constraint, Russell, with one wave of his magic wand, exorcised the spectre of pragmatics out of deductive logic. This exorcism yielded two results, the first intended, the second perhaps not altogether obvious to the exorcist himself at the time:

- a) Deductive logic was rescued as a closed, internally- consistent, coherent system.
- b) The instrument of deductive logic was removed, once and for all, as the serious contender for modelling, describing or explaining human language — or mind.

Givón continues:

Neither language nor mind abides by the requirement of closure, except perhaps temporarily, for limited tasks. Both language and mind are necessarily open systems that continually expand, add meta-levels, learn and modify themselves... consciousness is forever adjusting its frame, shifting meta-levels, it keeps re-framing and reflexively framing itself... It is the precondition for the mind's ability to select, evaluate, file, contextualize and respond appropriately to mountains of information. (Givón, 1989, p.4)

The best way to conceptually engage with complex configurations of media-elements is not through the use of a text but through the experiential examination of mutable context. In terms of the "operational" nature of context, characteristic of the techno-poetic mechanism, we become engaged with the observation of a situation that "is forever adjusting its frame," with the potential for "shifting meta-levels," one that "keeps re-framing and reflexively framing itself..." based upon our active participation and input. This framing and reframing is also extended through the external perspectives that textual observation provides within this dissertation. Givón later talks about "abductive inference" and "analogic reasoning." He elucidates these as follows:

The non-pragmatic tradition speaks of two modes of knowledge — or modes of inference — deductive and inductive. The first proceeds from the general rule to its specific instances. The second presumably proceeds from specific instances to the general rule. Pragmatically-based abductive inference — concerning appropriateness of context, importance, relevance, similarity or explanation — is in principle a different kind of reasoning. It proceeds by hypothesis, guesswork or intuition, often by analogy. It is thus, in principle, unconstrained. (Givón, 1989, p.7)

This thesis employs each of these modes of knowledge in order to define aspects of the techno-poetic mechanism. This device can be read as a machinic generator of "specific instances" of language-vehicle use, stemming from an initial intuition or hypothesis. Abductive, deductive and inductive logic have all been invoked in this project.

Deleuze and Guattari in *A Thousand Plateaus* have described the following methodology in relation to the exploration of environmental configurations of signs referring to *Pragmatics*:

Pragmatics as a whole would consist in this: making a tracing of the mixed semiotics, under the generative component; making a transformation map of the regimes with their possibilities for translation and creation, for budding along the lines of the tracings; making the diagram of the abstract machines that are in play in each case, either as potentialities or as effective emergences; outlining the program of the assemblages that distribute everything and bring a circulation of movement with alternatives, jumps and mutations. (Deleuze and Guattari, 1987, p.147)

I will show how this procedure can be seen to be implemented in my project. Research has informed the textual development of four historical strands relevant to the exploration of emergent meaning as explored within my specific generative virtual environment: "A Background Survey of Relevant Technological Systems;" "A Survey of Relevant Artistic , Philosophical and Literary, Strategies;" "A Survey of Relevant Music and/or Sound Strategies;" and "A Selection of Hybrid Technological, Literary and Artistic Works — Toward the Definition of a Filed: Recombinant Poetics." These surveys function, in part, as a particular "tracing of the mixed semiotics" of artistic strategies which inform the construction of the device. This mechanism is operational as an advanced form of "transformation map" functioning in a time -based setting; a "map" of it's own use.

At present, much technological media-discourse functions only in the realm of text, although the field of media-discourse is rapidly changing. Language can only partially address the complex nature of experience generated through the use of electronic media, hence the techno-poetic mechanism is authored as a higher-order semiotic system. The

device explores how experience is potentially constructed, enabling an examination of shifts in meaning, and alternately, how meaning can become exploded and seemingly fall away. Through use of the system, the participant examines a series of momentary states of meaning in a continuous process engaged with emergent meaning production. We observe the nature of meaning as a transformational and accretive process. We could say that the techno-poetic mechanism, functioning in tandem with the textual dissertation, becomes a "working diagram of the abstract machines" (Deleuze and Guattari, 1987, p.147) that characterise the environment. The functioning mechanism will be discussed at length in the chapter entitled "A Specific Techno-Poetic Mechanism Exploring Emergent Meaning: *The World Generator/The Engine of Desire*." It is in this chapter that I will be "outlining the program of the assemblages that distribute everything and bring a circulation of movement with alternatives, jumps and mutations," (Deleuze and Guattari, 1987, p.147) as earlier suggested by Deleuze and Guattari. The operative nature of the techno-poetic mechanism builds upon concepts elucidated by Deleuze and Guattari, they are unique to my project and enable the exploration and examination of emergent meaning.

1 Pragmatics traces its illustrious ancestry to the pre-Socratic Greek dialecticians, then via Aristotle to Locke, Kant and Peirce, eventually to 19th Century phenomenologists and --last but not least--to Ludwig Wittgenstein. In cognitive psychology, pragmatics underlies figure-ground perception, primed storage and malleable recall, attended ('context-scanning') information processing and flexible ('prototype') categorization. In linguistics, pragmatics animates the study of contextual meaning and metaphoric extension, frame semantics and the semiotics of grammar-in-discourse, the sociology of language and the acquisition of communicative competence. In anthropology, pragmatics is reflected in the exploration of cultural relativity, ethnomethodology and in cross-cultural cognition. (Givón, 1989, Preface)

1.2.9 Eisenstein: Montage

In continuing to approach the "tracing of the mixed semiotics" (Deleuze and Guattari, 1987, p.147) Eisenstein presented a series of insightful observations about film in relation to meaning. I will here present a set of his concepts and suggest how they might be newly applied to the techno-poetic mechanism. In *How I Became a Director*, Eisenstein suggests the following about the birth of montage:

From the process of production, a technical term has passed into linguistic currency, designating a mechanical assembly, a set of water conduits, or machine tools. The beautiful word for such a construction is — 'montage.' (Eisenstein, 1945, p.245)

Eisenstein also spoke about "montage" (as quoted in Aumont) in relation to the notion of a machine-like juxtaposition of fragments:

What we need is science, not art. The word creation is useless. It should be replaced by labor. One does not create a work, one constructs it with finished parts, like a machine. Montage is a beautiful word: it describes the process of constructing with prepared fragments. (Aumont, 1987, p.150)

My vehicle of art production made operative through computer-science, literalises the operational nature of a juxtaposition of "prepared fragments." I am seeking to construct a bridge between science and art exploring a concept analogous to the employment of media "fragments" as a poetic construction strategy. My technique can be used to produce a myriad of unique media-configurations. The manipulation or operative nature of the work is put into the hands of the *vuser*. The "fragments" spoken of above suggesting that this system could be "like a machine," elucidated in terms of film technology, is central to my discourse. In the historical sense, this again re-states the notion of a hardware/software paradigm: film (software), working in tandem with a machine (hardware) — the projector, whereas computers enable random access to data, as well as abstraction and manipulation processes, film is a linear, time-based medium. It is the computer that facilitates an ease in the ordering, re-ordering and complex spatialising of time-based digital video. In film, montage is facilitated by the cut, where film passes in front of an illuminating source, bringing about the viewing of an alternate image. In Virtual Reality, the image is constantly being generated through light emissions. Although the space appears continuous, it is generated through on/off alterations of pixels, comparable to the filmic cut but functioning on a minute, computer-based scale. The appearance of designated media-objects is generated by the virtual proximity code which activates changes in pixel states. These changes are made in groups and thus generate the illusion of the particular spatial media-relation. The filmic cut occurs in the time/space of the film pull-down, between individual frames; virtual change occurs in the time space of a grouping of pixel changes and is equal to the refresh rate of a given computer.

The mechanism created for my project makes potential filmic (digital video) "fragments" and other media-elements operative to the user of the system, dimensional in a different way to that of film. These fragments can potentially be organised in a virtual space — positioned and repositioned across a media landscape. In *Expanded Cinema*, Gene Youngblood articulates the potential of computers:

Aesthetic application of technology is the only means of achieving new consciousness to match our new environment. ...Perhaps we can learn to understand the beauty of a machine that produces the kind of visions we see in expanded cinema. (Youngblood, 1970, p.189)

The techno-poetic mechanism in part abstracts and virtualises the kinds of environments described in *Expanded Cinema* (Youngblood, 1970) My device "nests" motion pictures (now in the digital realm) and enables their instantaneous re-constitution (re-ordering). The system enables non-linear viewing, "projection" of digital video onto objects, the potential of altering the level of media-element transparency, the ability to alter media-element spatial behaviour, as well as the potential to explore media-element dispersion in virtual space, as generative activity.

Eisenstein developed theories surrounding the employment of montage techniques. The most important aspect of his theories, for my purposes, deal with the fact that media-elements, when juxtaposed, generate a "creation" which is greater than the sum of its parts:

The basic fact was true and remains true to this day, that the juxtaposition of two separate shots by splicing them together resembles not so much a simple sum of one shot plus another shot — as it does a creation. It resembles a creation — rather than the sum of its parts — from the circumstances that in every such juxtaposition the result is qualitatively distinguishable from each component element viewed separately. (Eisenstein, 1974, p.8)

It is this aspect of "creation" that is central to the generation of emergent meaning.

Eisenstein further articulates his concept of creation:

The strength of montage resides in this, that it includes in the creative process the emotions and the mind of the spectator. The spectator is compelled to proceed along that selfsame creative road that the author travelled in creating the image. The spectator not only sees the represented elements of the finished work, but also experiences the dynamic process of the emergence and assembly of the image just as it was experienced by the author. (Eisenstein, 1974, p.32)

Unlike Eisenstein, there is not a pre-edited entity that the participant experiences, but there is, however, an operative realm of probability, in which the menu system functions as a constant. The participant becomes actively involved with inter-authorship. Heightened engagement, in which the participant "experiences the dynamic process of the emergence," is what I make palpable to the *vuser*.

I, too, am exploring a co-mingling of the denotative with the depictive, as encountered in virtual space. I have spoken about the use of media-elements, taken from one context and recontextualised in another. Eisenstein was influenced to some degree by Japanese poetics, in particular the compressed form of the *Tanka*. He was well informed about the use of Hieroglyphs: "Hieroglyphs developed from conventionalised features of objects, put together, express concepts i.e. the picture of a concept — an ideogram." (Eisenstein, 1949, p.25) He went so far as to suggest that a *Tanks* (a short Japanese

poem) could be seen as a kind of shot list. He wrote "From our point of view, these are montage phrases. Shot lists. The simple combination of two or three details of a material kind yields a perfectly finished representation of another kind — psychological." (Eisenstein, 1949, p.32) It is this psychological space, generated through the perception of the spatial juxtaposition of media-elements, that contributes to an exploration of emergent meaning. Eisenstein pointed toward the conjunction of the denotative (text) and the depictive (picture) in Japanese arts, stating "Not only did the denotative line continue into literature, in the *Tanka*, as we have shown, but exactly the same method (in its depictive aspect) operates also in the most perfect examples of Japanese pictorial art." (Eisenstein, 1949, p.32)

The functionality of *The World Generator/The Engine of Desire* presents a new technological form of spatial montage. Where Eisenstein explored fixed splices of filmic time, I am exploring a splice of volumetric space, or virtual graft. Visually, this is manifested in two ways in the generative world — the *vuser* sees menu items and when one is selected, observes this media-element entering the space through a spatial dissolve. The *vuser*, through their choice, brings about dynamic cut-like changes in the dimensional space. These decisions enable instantaneous, evocative, collisions or interpenetrations of media-elements.

Eisenstein, in speaking about montage, suggests that it was a form of "collision." "A view that from the collision of two given factors arises a concept." (Eisenstein, 1949, p.37) He continues, relating such an idea to metaphors from physics:

Recall that an infinite number of combinations is known in physics to be capable of arising from the impact (collision) of spheres. Depending on whether the spheres be resilient, non-resilient or mingled. (Eisenstein, 1949, p.37)

This quote falls neatly into my discussion of *fields of meaning* and *meaning force* as described earlier. Eisenstein explores this notion of force from the perspective of "conflict." He goes on to say:

So, montage is conflict. As the basis for every art is conflict (an "imagist" transformation of the dialectical principle). The shot appears as the cell of montage. Therefore it also must be considered from the viewpoint of conflict.

Conflict within the shot is potential montage, in the development of its intensity shattering the quadrilateral cage of the shot and exploding its conflict into montage impulses between the montage pieces. As, in a zigzag of mimicry, the *mise-en scene* splashes out into a spatial zigzag with the same shattering... (Eisenstein, 1949, p.37)

From the above quote, where Eisenstein discusses "conflicts within the shot," I can further legitimise my understanding of the techno-poetic mechanism from a montage perspective. Although virtual reality is spatial, it is constructed through the presentation of a sequence of spatial two-dimensional views of a three-dimensional space. Immersive virtual space is simultaneously generated by presenting two slightly different perspectives of the three-dimensional space. I have chosen to show only a singular high resolution data-projection in displaying the techno-poetic mechanism. Although the technology has changed from film to the computer, we are still experiencing an expanse of vision — individual frames that are merged through engagement with the persistence of vision facilitated within this time-based technology. Conflict, or meaning-forces (as I have referred to them above) are juxtaposed within this virtual terrain, both through spatial location (at any given moment arising from the perspective of the *vuser*), and time-based relative proximity (derived through *vuser* interaction with the system). Thus, media-elements can be juxtaposed presenting digital cut-like transitions within the environment through slow spatial revealing (as derived during navigation), radical juxtaposition brought about through media-behaviours, selected engagement with computer based processes presented on the menu system (similar to the *Random All* function), and by *vuser* selection and placement within the environment.

Eisenstein outlines a series of relevant "cinematographic" conflicts, which I believe directly relate to the operational nature of the techno-poetic mechanism:

- Conflict of graphic directions (lines-either static or dynamic).
- Conflict of scales.
- Conflict of volumes.
- Conflict of depths.
- And the following conflicts, requiring only one further impulse of intensification before flying into antagonistic pairs of pieces:
- Close shots and long shots.
- Pieces of graphically varied directions.
- Pieces resolved in volume, with pieces resolved in area.
- Pieces of darkness and pieces of lightness.
- Conflicts between an object and its dimension - and conflicts between an event and its duration.

The compression of all cinematographic factors and properties within a single dialectical formula of conflict is no empty rhetorical diversion.

We are seeking a unified system for methods of cinematographic expressiveness that shall hold good for all its elements. The assembly of these into series of common indication will solve the task as a whole.

Experience in the separate elements of the cinema cannot be absolutely measured. (Eisenstein, 1949, pp.38-39)

The techno-poetic mechanism enables the dynamic exploration of meaning-forces as experienced through the manipulation of fields of meaning. I would suggest that the word "conflict" specifically embodies Eisenstein's interest in certain heightened forms of meaning-force. I have outlined earlier the dynamic functionality of my device. We can see the parallels to Eisenstein's list of "conflicts" to operations that are made interactive within the generative virtual environment (although "meaning-force" can be seen to be functioning on a more subtle conflictual level). I have spoken of the time-based summing of meaning forces and my interest in loading fields of meaning with particular subject matter to achieve an outcome which is greater than the sum of its parts, although I am pushing beyond the confines of film. Eisenstein posits this description which also sheds light on experience in my generative virtual environment:

These stimuli are heterogeneous as regard their "external natures," but their reflex-physiological essence binds them together in iron unity. Physiological in so far as they are "psychic" in perception, this is merely the psychological process of a higher nervous activity.

In this way, behind the general indication of the shot, the physiological summary of its vibrations as a whole, as a complex unity of the manifestations of all stimuli, is present. This is the peculiar "feeling" of the shot, produced by the shot as a whole.

... The basic indication of the shot can be taken as the final summary of its effect on the cortex of the brain as a whole, irrespective of the paths by which the accumulated stimuli have been brought together. Thus the quality of totals can be placed side by side in any conflicting combination, thereby revealing entirely new possibilities of montage solutions. (Eisenstein, 1949, p.67)

Eisenstein foresaw the neural collage — a registering of experience that happens "irrespective of the paths by which the accumulated stimuli have been brought together" — that makes up experience. He is keenly aware of the emergent conceptual realm brought about through the exploration of media. He even foresaw the genetic relations inherent to my approach: "As we have seen, in the power of the very genetics of these methods, they must be attended by an extraordinary physiological quality." (Eisenstein, 1949, p.67) It is the operational characteristics of my device, that takes my practice to a different communicative space than filmic montage. My virtual environment is constructed of a multiplicity of visual media-elements and can be seen as singular computer-based shots which nest these varying components.

Greg Ulmer, in *Teletheory*, discusses how Eisenstein's practice bridges science and art:

Eisenstein believed that only in the new medium of film could the separation between the science and the arts (we might say between science and the discourse of patterning) be resolved in a hybrid discourse... Eisenstein designed a style that represented the very movements or dynamics of thought, in which concept formation functioned in terms of story telling. (Ulmer, 1989, p.58)

Thus, the nature of spatial "patterning," brought about through interactive techno-poetic construction, enables one to explore "neighboring" (Saint-Martin, 1990, p.69) relations in a dynamic manner. It might be argued that Eisenstein was interested in the political nature of these forces and that the techno-poetic mechanism is in no way political. I would suggest that coming to better understand the nature of emergent meaning can be viewed as a political act. My techno-poetic mechanism also seeks to bring about an operative fusion between the arts and science. It does not seek to be a story-telling mechanism. The techno-poetic mechanism seeks to explore emergent meaning within an initially non-narrative environment. Its force as a political instrument resides in its ability to elucidate and make palpable subtle aspects of experience as it relates to meaning production. This discourse mechanism seeks, as a subtext, to help us understand a set of dynamic meaning-relations and to potentially apply that knowledge to situations which may arise outside of the device.

1.2.10 New Approaches to Collage/Montage —

Gregory Ulmer: "The Object of Post Criticism," *Teletheory* and *Applied Grammatology*

Gregory Ulmer expresses the "organizing principle" from *Applied Grammatology* :¹

The organizing principle of applied grammatology may be simply stated (its complexity of operation having been discussed at length) — hieroglyphics. The hieroglyph emblemizes Derrida's lesson for didactic discourse, including its association with dephonicization (the realignment of writing with the visual arts); with the history of writing (Champollion's decipherment of the Rosetta Stone); with psychoanalysis as a science that approaches language and mind in terms of hieroglyphics (the dream as Rebus); with the history of mnemonics, from the AD Herenium of computer terminals, involving the technics of information storage and retrieval. The import of the hieroglyph as an emblem of the new pedagogy is that teaching must now include in its considerations the nondiscursive and imagistic dimensions of thought and communication. (Ulmer, 1985, p.265)

The techno-poetic mechanism seeks to enfold all of these approaches within an operative computer-based environment. In that sense it could be called an applied grammatological machine.

Along with montage, collage methodologies are relevant to the techno-poetic mechanism. Collage is made up of various elements "pasted together in incongruous relationship for their symbolic or suggestive effect." (*Webster's New Universal Unabridged Dictionary*, 1983, p.354) A rich history of collage is informed by Marcel

Duchamp, Suzanne Duchamp, Jean Croti, Hanna Höch, Pablo Picasso, George Braque, Kurt Schwitters, Joseph Cornell, André Breton, Max Ernst, Robert Rauchenberg, Jasper Johns, Barbara Kruger, Marcel Broodthayers and others. These artists can be seen to inform the potentials of the techno-poetic mechanism. Unlike their work my techno-poetic device enables a form of 3D spatial collage of media-elements, as presented within a virtual environment. A complete examination of the relevance of collage to my project falls outside of the scope of this document but I will, however, elucidate a set of relations surrounding the use of collage relevant to my project.

Along with artistic practice, I am interested in understanding my generative virtual environment as a discourse mechanism.² Derrida, in his textual "collage" project *Glas*, (Derrida, 1986) has paved the way for experiments in poetic discourse. Gregory Ulmer, coming after Derrida, has developed his own set of approaches to discourse mechanisms. Ulmer states that his *Teletheory* is the "application of [Derrida's, emphasis Seaman] Grammatology to television...to learn from it a new pedagogy." (Ulmer, 1989, p.vii) I am interested in Ulmer's exploration of Derrida's concept of the gram as a collage-like mechanism. Ulmer provides this view:

In spite of its associated complexities and controversies, Derrida's notion of the "gram" offers the theory of language most adequate to the collage mode of invention by interruption. Grammatology — the science of writing of which teletheory is the electronic representative — is poststructuralist in that it replaces the "sign" (signifier and signified — the basic unit of meaning in structuralist semiotics) with a different unit — the gram. (Ulmer, 1989, p.146)

Derrida defines the Gram as follows:

It is a question of producing a new concept of writing. This concept can be called gram or difference [différance, emphasis, Seaman]...Whether in the order of spoken or written discourse, no element can simply function as a sign without referring to another element which itself is not present. This interweaving results in each "element" — phoneme or elements of the chain or system. This interweaving, this textile, is the text produced only in the transformation of another text. Nothing, neither among the elements nor within the system, is anywhere ever simply present or absent. There are only everywhere, differences [différance] and traces of traces. The gram then is the most general concept of semiology. (Derrida, 1981, p.26)³

I have thus far chosen to focus on the Peircian definition of the sign, which can be seen as directly related to the concept of the gram. (Peirce, 1931, p.171) Peirce pointed to the strange nature of the sign and uses a related (veiled) analogy to the textile and its absence:

But an endless series of representations, each representing the one behind it, may be conceived to have an absolute object at its limit. The meaning of a representation can be nothing but a representation. In fact it is nothing but the representation itself conceived as stripped of irrelevant clothing. But this

clothing never can be completely stripped off; it is only changed for some more diaphanous. So there is an infinite regression here. Finally, the interpretant is nothing but another representation to which the torch of truth is handed along; and as representation, it has its interpretant again. Lo, another infinite series. (Peirce, 1931, p.171)

In the chapter "Emergent Constructions: Re-embodied Intelligence," I will present the analogy of the Jacquard loom as well as its genetic relevance to the techno-poetic mechanism — a device which presents experience through time-based perceptual textiles of light and sound. The techno-poetic mechanism enables a form of spatial electronic "graft" which is central to my concept of recombinant poetics. Derrida defines this recombinant potential:

And this is the possibility on which I want to insist: the possibility of disengagement and citational graft which belongs to the structure of every mark in writing before and outside of every horizon of semio-linguistic communication; in writing, which is to say in the possibility of its functioning being cut off, at a certain point, from its "original" desire-to-say-what-one-means and from its participation in a saturable and constraining context. Every sign, linguistic or nonlinguistic, spoken or written (in the current sense of this opposition), in a small or large unit, can be cited, put between quotation marks; in so doing it can break with every given context, engendering an infinity of new contexts in a manner which is illimitable (Derrida, 1977, p.185) [also cited in (Ulmer, 1989, p.147), emphasis Seaman]

Internalised appropriation, or "graft," is made operative within the techno-poetic mechanism. Each *vuser* of the system, through interaction, re-spatialises elements from the media-collection generating a series of grafts of various media-elements. The metaphorical growing together of these grafts functions to generate emergent meaning. Ulmer goes on to point out the collage-like relevance of Derrida's statement:

In critical theory as in literature collage takes on the form of citation, is the limit-case of citation, with Derrida's *Grammatology* being the theory of scripting as citation, although the insistence of the "graft" indicates a heritage of the tree that must be exceeded by the rhizome. (Ulmer, 1989, p.147)

The generative virtual environment makes operative this spatial exploration of the gram. I have discussed the relevance of the concept of the rhizome to my project and relevant also, is Ulmer's essay, "The Object of Post Criticism" in *The Anti-Aesthetic: Essays on Postmodern Culture*. In this text Ulmer succinctly describes a set of potentials related to new forms of critical writing. He says:

I will argue, following White's lead, that "post-criticism" (— modernist, — structuralist) is constituted precisely by the application of the devices of modernist art to critical representations; furthermore, that the principal device

taken over by the critics and theorists is the compositional pair collage/montage. (Ulmer, 1983, p.83)

My techno-poetic mechanism seeks to build on the exploration of operational collage/montage processes within this new generative rhizomatic spatial context and to do this through the technological construction of an enabling electronic mechanism, capable of making collage/montage operations which are not fixed, but, mobile, fleeting and continuously *operational*. Ulmer is now exploring his own form of navigable zones of conceptual mapping. My techno-poetic environment enables the *vuser* to explore a set of modular elements within a continuously active, non-fixed, relativistic space. Ulmer further elucidates his practice of "post-criticism:"

The interest of collage as a device for criticism resides partly in the objectivist impulse of cubism (as opposed to the non-objective movements which it inspired). The cubist collage, by incorporating directly into the work an actual fragment of the referent (open form), remains "representational" while breaking completely with the trompe l'oeil illusionism of traditional realism. (Ulmer, 1983, p.84)

In virtual worlds, the map is potentially coextensive with the territory⁴. Obviously, this is no longer just a collaged/montaged textual/video environment, but now incorporates the mixed semiotics of music, digital video, digital stills, spatial text, 3D objects, texture maps and spoken voice. Ulmer goes on to say:

The operation which may be recognized as a kind of "bricolage" (Lévi Strauss), includes four characteristics — *découpage* (or severing); performed or extant messages or materials; *assemblage* (montage); discontinuity or heterogeneity. "collage" is a transfer of materials from one context to another and "montage" is the "dissemination" of these borrowings through the new settings. (Ulmer, 1983, p.84)

The techno-poetic mechanism focuses on "collage" and "montage" strategies within an operative, interactive environment, enabling on-going change and non-fixity. We could call my generative virtual environment an operational "post-criticism" discourse mechanism.

Ulmer also speaks about Barthes relation to the question of post-criticism:

Barthes explained that modernist poets, beginning at least with Mallarmé, had demonstrated already the unification of poetry and criticism — that literature was itself a critique of language and that criticism had no "meta" - language capable of describing or accounting for literature. Barthes concluded that the categories of literature and criticism could no longer be kept apart, that now there were only writers. The relation of the critical text to its object of study was to be conceived in terms of no longer subject-object but of subject-predicate (authors and critics both facing the same material-language), with critical

"meaning" being a "simulacrum" of the literary text, a new "flowering" of the rhetoric of literature." (Ulmer, 1983, p.86)

This notion that "critical meaning" is a "simulacrum of the literary text" is expanded within the techno-poetic mechanism to include various forms of digital media as potentially explored within a cyber-polysemic media-environment. The techno-poetic mechanism is navigated and controlled through an interface conjoining physical space with virtual space. The work is negotiated through a physical interface where tactile motion is translated from this physical device to the virtual one, enabling functionality within the virtual space. We could call this device a meta-operative mechanism, in that this environment enables one to experience emergent meaning through qualities of "difference" [différance] (Derrida, 1976, p.23) in an operational manner.

1 See *Applied Grammatology* (Ulmer, 1985) for an extended musing on montage and collage potential in terms of new forms of writing.

2 See *Discourse Networks 1800 /1900* (Kittler, 1985).

3 Also cited in Ulmer, 1989, p.146.

4 See the discussion above related to Baudrillard. See also *Into the Image* (Robins, 1996, p.45). Robins presents a series of what he calls, quotes with a "clichéd feel" by Lanier and others. Lanier states: "The computer is the map you can inhabit." This quote was suggested to Seaman by Greg Ulmer during an exchange on his Invention listserve: INVENT-L@lists.UFL.EDU.

1.2.11 Repeatability and Difference

As my art work brings about shifting worlds of difference to generate meaning, a delicate play between creation and destruction is brought into being by exploring what Derrida calls a "graft," (Derrida, 1977b, p.185) and through his concept of "Différance." (Derrida, 1976, p.23) He states: "There are only everywhere, differences and traces of traces." (Derrida, 1981, p.26) My device seeks to enable the observation of structure and the nature of shift, through an operational, malleable virtual composition system. Each trace, or volumetric "graft," qualifies the environment where the "graft" is recontextualised. Deleuze, in speaking about cinematic production states: "...the movement-image expresses a whole which changes and becomes established between objects: this is a process of differentiation. (Deleuze, 1986, pp.28-29) I am extending the malleability of the image through computer-based exploration. He suggests:

The similar and the digital, resemblance and code, at least have in common the fact that they are moulds, one by perceptible form, the other by intelligible structure: that is why they can so easily have links with each other. But modulation is completely different; it is a putting into variation of the mould, a

transformation of the mould at each moment of the operation. If it refers to one or several codes, it is by grafts, code-grafts that multiply its power (as in the electronic image). By themselves, resemblances and codifications are poor methods; not a great deal can be done with codes, even when they are multiplied, as semiology endeavours to do. It is modulation that nourishes the two moulds and makes them into subordinate means, even if this involves drawing a new power from them. For modulation is the operation of the Real, in so far as it constitutes and never stops reconstitution of the identity of the image and object. (Deleuze, 1986, pp. 27-28)

The techno-poetic mechanism is an interactive facilitator of "code-grafts." I have sought to define a modulation mechanism to explore and examine emergent meaning by authoring a mechanism that through non-closure "never stops reconstitution of the identity of the image and object." I would hope that this will be seen as enabling significant modifications to both "resemblances and codification."

In terms of poetic precursors, Marcel Duchamp opened the door onto this form of operational artistic experience with his *Large Glass* (1915-1923)¹ and the *Box in a Valise*. (1941) Duchamp's intentionality puts chosen elements of the creative process into the hands of the viewer/participant. Modular inscribed notes qualify the evocative nature of the *Large Glass*. The role of the *vuser* functioning as an active decoder and performer/participant within my operative work is a key notion. This form of operative, interactive work, marks a shift away from traditional forms of poetic works. Umberto Eco talks about the relation of the participant in "open" works of art:

A work of art, therefore, is a complete and closed form in its uniqueness as a balanced organic whole, while at the same time constituting an open product on account of its susceptibility to countless different interpretations which do not impinge on its unadulterable specificity. Hence every work of art is both an interpretation and a performance of it, because in every reception the work takes on a fresh perspective for itself. (Eco, 1989, pp.3-4)

The non-closed nature of the aesthetic output from the techno-poetic mechanism paradoxically extends this description, both complete and closed in terms of the presented diversity of its operative media-elements, and "open" and emergent in relation to the recombination or *grafting* of those media-elements. Each *vuser* will have a slightly different experience with any work of art, based on idiosyncratic mind sets. Roy Ascott provides the following observation on the work of Duchamp, speaking about a particular form of interactive "negotiation" of a work:

Duchamp understood that the work of art does not reside in the object alone but in a system, a negotiation between artist and spectator in the creation of meaning... It is in Duchamp that we first encounter the decisive rupture in western art, from the passive pleasure of the contemplation of the beautiful to the "exegetical/eisegetical" relationship of all of the parties involved in the

creative process, the reading of meaning into and the reading of meaning out of this new mode of image/text. (Ascott, 1985, p.51)

This dynamic relation is also manifested and extended through exploration of media-elements within my techno-poetic mechanism. A potentially different *range* of diverse poetic variables are encountered by each subsequent *vuser* of the work of art. A qualitative difference between each viewing/use of a particular work is generated through the recombinational nature of the mechanism. I have sought to make an emergent work which "gains its aesthetic validity precisely in proportion to the number of different perspectives from which it can be viewed and understood." (Eco, 1989, p.3) In addition to questions related to the differences of a particular *vuser's* mind-set as it pertains to alternate readings of a given environment, we now can see that an environment can be composed entirely differently by each participant, while generated from the same initial set of media-variables. The potential number of the different worlds that can be generated is astronomical when we consider the following characteristics: the number of media-elements included in the system, the spatial nature of their potential distribution, the potential of their interpenetration forming hybrid objects, the nature of their potential abstraction, the nature of movement through the virtual space, and the nature of behaviours attributed to the elements. We could spend an entire life observing alternate permutations without repeating the experience, endlessly exploring this world of unfixity and difference [différance].

Outside of the difference that is generated through use of my system, there is still a relative consistency to each experience. There is always the potential beginning point — starting from an empty world and utilising the menu system. The menu system itself is a context and functions as a constant in terms of the mechanism. The user of the system disrupts or "draws from" that given context to generate a new media-world.

I See the later chapter "A Survey of Relevant Literary, Philosophical and Artistic Approaches" for an extended discussion on the relevance of Duchamp's work.

1.2.12 A Mechanism that Embraces Paradox

Within a spatial environment, the exploration of collage and montage methodologies can enable the generation of highly complex worlds. As an artist undertaking research, I do so from a mind-set that embraces paradox. I have sought to be as clear and logical as possible within this written dissertation. I seek to point toward a methodology of conveyance where outwardly conventional logic can fall apart. The techno-poetic device is a machine designed to generate abductive instances of media-element composition, so

that we can begin to form a more general understanding of how these language-vehicles function in terms of generating emergent meaning. Fann, in *Peirce's Theory of Abduction* states:

Abduction is an inference from a sample to a whole, or from particulars to a general law; abduction is an inference from a body of data to an explaining hypothesis, or from effect to cause...

Abduction invents or proposes an hypothesis; it is the initial proposal of an hypothesis on probation to account for the facts. (Fann, 1970, p.10)

Thus, abductive logic is used to move from a series of perspectives related to emergent meaning, to a means of informing the construction and elucidation of the techno-poetic mechanism.

One paradox that could be suggested in relation to the techno-poetic mechanism, intimates that emergent meaning arises, to some degree, at the demise of meaning previously generated.¹ From a time-based perspective this proves to be false, because this shift can be said to contribute to the complex accretive nature of meaning within this time-based environment. Meaning arises as a time-based conflation of various experienced evocations across a series of generated and changing contexts. Thus, meaning itself becomes complexly enfolded.

The techno-poetic mechanism is both complete and closed in terms of its media-elements, as well as "open" and emergent in relation to the recombination and interpenetration of those media-elements. This registers as a paradox related to closure. It also questions the definition of closed systems.

I have earlier talked metaphorically about invoking the paradox addressed by Herbert, where the techno-poetic environment can either be seen in the metaphorical light of waves (an intermingling of fields) or particles (modular-media elements comprised of pixel configurations), depending on how one is observing it.

I have also pointed out that the device can function paradoxically as a means of discourse, yet, in itself, as an artwork, can be seen as an example of "purposeful purposelessness or a purposeless play " (Cage, 1967, p.12) wherein my work functions as an environment that explores various meanings at play.

Because the work, at times, intentionally explores nonsense relations (which I later elucidate in the chapter entitled "Nonsense Logic") I am at times exploring a paradoxical

logic of the illogical. This is particularly important because the operation of computers is predicated on logical processes.

I am also interested in making experiential the nature of meaning-forces in the techno-poetic mechanism. By exploring elements carrying condensed content, or multiple potential evocations, we could say that the meaning-force of these elements paradoxically pushes in a divergent set of conceptual directions simultaneously.

Another paradox inherent to the techno-poetic mechanism deals with the ephemeral nature of the environment. By making meaning more fleeting, we can begin to experience directly the nature of "fleetingness," and in turn have a more fixed or clearer definition of this aspect of meaning production.

We might say that paradox potentially arises whenever the ability of language to reflect the true complexity of reality breaks down. I do not lament this complexity. I seek to embody its potential observance within my generative virtual environment. This complex space intends to function as an experiential means of addressing paradox. By acknowledging this complexity as being inherent to the techno-poetic mechanism, this becomes a strategy of further exploring the nature of emergent meaning.

1 See the discussion of Derrida's concept of "différance" (Derrida, 1976, p.23) referred to previously.

1.2.13 Inter-Authorship

Central to the evocative nature of the work is inter-authorship. The computer presents an artistic medium that extends notions of authorship and inter-authorship in many ways. We can look at the computer code in my techno-poetic work, as layers functioning on multiple levels. We start at the bottom, with assembly language. We then enfold other logical layers, including programs employed in the creation of media-elements, which now enable the construction of an upper or outer layer of code that metaphorically floats on the surface of the system, presenting images, music/sound and text. Although I feel that I am the author of this particular system, working in conjunction with Gideon May as programmer, I must point toward the complex infrastructure of pre-authorship that enables its propagation as well as the vital inter-authorship of the *vuser*.

A graphical user interface can function in a non-hierarchical and non-linear manner in relation to the presentation of artistic content. The interface may also embody paradox,

nonsense, play — any quality of aesthetic phenomena deemed relevant by the author or authors of electronic computer-based art works. I am examining computers as being expressive vehicles, housing and enabling the exploration of operative poetic elements actuated through this series of interdependent levels of "code" authoring. Meaning processes may function on various levels from the local to the international, through the connectivity of computers and the possibilities presented by distributed interactivity, these networks of poetic elements can be housed on a single computer or can be distributed through machines which are connected across massive distances. Early on, Roy Ascott describes the potentials of inter-authorship:

That I would see as the grand aspiration of network art, where the work of art, the transformations of "creative data," are in perpetual motion, an unending process. In this sense art becomes not a discrete set of entities, but rather a web of relationships between ideas and images in constant flux, to which no single authorship is attributable and whose meanings depend on the active participation of whoever enters the network. (Ascott, 1984, p.56)

We must remember that the computer is a complex authored environment presented as a network of interrelations. The inter-authorship that I am most concerned with here is the interaction of the user with the authored mechanism (The work is never in a fixed state, although one can easily document examples of its use with video for subsequent discussion and viewing.) We could potentially store generated worlds and "lock them off," making them a fixed virtual space, but we (Gideon May and myself) have not as yet implemented this functionality, because vast digital storage spaces are not readily available. As an art work, it is also important that the environment is entirely transitory, abstractly reflecting the ephemeral nature of existence and the ubiquitousness of change.

The techno-poetic mechanism functions as an automated agent of a particular conception of authorship, enabling this new form of inter-authorship. Ricoeur discusses the social dimension of "the autonomization of action:"

In the same way that a text is detached from its author, an action is detached from its agent and develops consequences of its own. This autonomization of human action constitutes the *social* dimension of action. An action is a social phenomenon not only because it is done by several agents in such a way that the role of each of them cannot be distinguished from the role of the others, but also because our deeds escape us and have effects we did not intend. (Ricoeur, 1991, pp.153-154)

Along with intended meanings arising through interaction with the techno-poetic mechanism, non-intentional meanings can also be evoked, leading again to emergence. Here Ricoeur addresses some of the problematics surrounding this form of agency:

One of the meanings of the notion of "inscription" appears here. The kind of distance that we found between the intention of the speaker and the verbal meaning of a text occurs also between the agent and its action. It is this distance that makes the ascription of responsibility a specific problem. We do not ask, who smiled? who raised his hand? The doer is present to his doing in the same way as the speaker is present to his speech. With simple actions like those that require no previous action in order to be done, the meaning (noema) and the intention (noesis) coincide or overlap. With complex actions some segments are so remote from the initial simple segments, which can be said to express the intention of the doer, that the ascription of these actions or action segments constitutes a problem as difficult to solve as that of authorship in some cases of literary criticism. The assignation of an author becomes a mediate inference well known to the historian who tries to isolate the role of a historical character in the course of events. (Ricoeur, 1991, pp.153-154)

The techno-poetic mechanism presents an environment where meaning is derived through inter-authorship. A delicate negotiated landscape of meaning potentials is created through the action of the *vuser* who investigates and *repositions the artifacts of thought* that have previously been authored into the system. The complex composition of media-elements that arises may bear little resemblance to the original material that has been used to derive it. Ricoeur talks about this in terms of spatial discourse:

We just used the expression "the course of events." Could we not say that what we call the course of events plays the role of the material thing that "rescues" the vanishing discourse when it is written? As we said in a metaphorical way, some actions are events that imprint their mark on their time. But on what did they imprint their mark? Is it not in something spatial that discourse is inscribed? How could an event be printed on something temporal? Social time, however, is not only something that flees; it is also the place of durable effects, of persisting patterns. An action leaves a "trace," it makes its "mark" when it contributes to the emergence of such patterns, which become the *documents* of human action. (Ricoeur, 1991, pp.153-154)

The transitory nature of my virtual environment enables the creation of temporary and mutable computer-based traces and/or inscriptions of light and sound, through a direct spatiotemporal discourse mechanism (albeit within a virtual space). This environment presents a *real time* document of human action and interaction — an example of embodied inter-authorship. It makes palpable the dynamic, combinatorial nature of the recombinant sign.

1.2.14 Appropriation and the Recombinant Sign

Throughout my research I have sought to embody a set of issues concerning the observation and understanding of engagement with emergent meaning. One issue I have considered concerns the nature of the recombinant sign. There is a fine line between the notion of appropriation and plagiarism. Many artists, (starting with Duchamp), have

explored appropriation as an artistic strategy. The Critical Art Ensemble, in an essay entitled, "Utopian Plagiarism, Hypertextuality and Electronic Cultural Production" reflect upon the contemporary nature of the recombinant sign:

At present, new conditions have emerged that once again make plagiarism an acceptable, even crucial strategy for textual production. This is the age of the recombinant : recombinant bodies, recombinant gender, recombinant texts, recombinant culture. Looking back through the privileged frame of hindsight, one can argue that the recombinant has always been key in the development of meaning and invention. (Critical Art Ensemble, 1995, p.105)

The recombinant metaphor has been "in the air" since the early 90s. (If we count Eisenstein speaking about genetic operations (Eisenstein, 1949, p.67), it can be seen to have been in the air since 1928). I have explored poetic combinatorial strategies in my work since 1981. Unlike the Critical Art Ensemble, my project does not deal specifically with external "plagiarism." It does, however, explore notions of inter-authorship, wherein the content arises in response to the interaction of the user. In the mechanism, *The World Generator/The Engine of Desire*, the user of the system in one sense "appropriates" modular textual elements as in Derrida's "quotes" or "grafts" (Derrida, 1977b, p.185) that I have previously authored and positions them within an electronic environment. Unlike the radical stance taken by the Critical Art Ensemble, I am interested in the origins of quoted texts. I find critical inquiry central to the intellectual process — to be able to go back and find an initial context, to be able to read an entire body of thought, the oeuvre of a particular author, and to observe the relative meaning exhibited between one context and another. It is true that many artists have explored appropriation and the use of "found" materials to advantage in music, writing and pictorial creations. I see this as different from critical writing. I can see aspects of intermingling between art and critical discourse involved in the construction of my own project and have cited the authors quoted in this written dissertation.

Aligned, to some extent, with the Critical Art Ensemble, I have employed abstracted audio "samples" in the musical elements found in the device. My problem lies in the use of "plagiarism" in critical writing, intellectual discourse and inquiry. I see this plagiarism as being different to "appropriation" of media that becomes abstracted through artistic processes of fragmentation and recombination. Ironically, the Critical Art Ensemble attribute all of their sources in their text, tracing the artistic "plagiaristic" recontextualisations back to their original context. They paradoxically short-circuit the very methodology they describe.

The concept of the recombinant sign has at times been lamented in Postmodern literature. My project seeks to examine the concept in a positive, constructivist manner.

In *Data Trash*, Arthur Kroker and Michael A. Weinstein exemplify a cynical postmodern stance:

No longer the age of the information economy, the recombinant sign functions to destroy the relationship between meaning and communication. A born enemy of the technological media of "communication," the recombinant sign sets in motion a cultural economy drained of media (as simulacra of communication) and bleached of meaning, like the skeletal remains of dead cattle under the withering desert sun in all those faded westerns. Meaning slows down process bodies, acting as a circuit-breaker in the circulatory movements of cyber-culture. It must be destroyed and it is. Perfectly cybernetic, the recombinant sign hovers at the event horizon of the information(less) economy: a deep space worm that sucks into its imploding spirals all the dentrital matter of reclining culture. Finally freed of the inertial drag of social meaning and having warp-jumped over the densely accrued mass of (social) communication, the recombinant sign can become what it always wanted to be, but never could (in the age of technology as communication): a cultural microchip that speeds up the passing (virtual) scene to mega-overdrive, recodes the human species into an elliptical game of simulation and burns down the remaining signs of intelligent life (lurking in embodied flesh) into brilliant flare-out that spreads its terminal signature-pattern across the digital sky. For the recombinant commodity, information checkmates process and it must be vectorized. (Kroker, 1994, p.30)

In counter-distinction to this statement, I will point toward a fertile history of forms of recombinational poetic strategies relevant to the "recombinant sign," in order to propose productive alternatives to these cynical stances. The employment of recombinant strategies can be witnessed in many art works, both analogue and digital. The chapter entitled "A Survey of Relevant Literary and Artistic Strategies" will address this issue.

In re combinatorial environments, meaning is characterised by a fluid, shifting, continuous state of becoming. In this form of fleeting context, content is always emergent, arising out of the superimposition and or juxtaposition of a series of "poetic" elements and processes functioning in relation to one another. Computer-based environments heighten the potential "relativity" of signs, because the sign is often encountered within an "operative" environment, linked to or standing in relation to a particular emergent context. I intend to invoke "relative" meaning in a positive, constructive manner. In an ideal world, each vuser would also experience my mechanism, and indeed, I am working to give access to the environment to a larger audience.

Fleeting and shifting qualities of engagement become an experiential focus. During interaction, the *vuser*, through direct experience, encounters a series of potential "states" of meaning. We should always view these states as a temporary glimpse at a

continuous process of meaning-becoming, motivating the thought and behavioural reaction of the *vuser*.

Most of the intercourse inherent to the recombinant sign will be examined in relation to "art" content. My research seeks to obliquely point to the larger world of content generation — to other general interactive computer-based contexts. In particular, I seek to point toward contemporary media-environments in which many of us spend time. Currently, the exploration of virtual space can be seen as unusual. We can postulate that it will become, in time, commonplace.

1.2.15 Issues Surrounding Navigation

Central to the emergent perception of generative worlds is the process of navigation. Pivotal to the experience of navigation is the notion of "drift" facilitated through technological means. Barthes discusses "drift" in *The Pleasure of the Text*:

My pleasure can very well take the form of a drift. Drifting occurs whenever I do not respect the whole and whenever by dint of seeming driven about by language's illusions, seductions and intimidations, like a cork on the waves, I remain motionless, pivoting on the intractable bliss that binds me to the text (to the world). (Barthes, 1975, p.18)

Obviously drift within a virtual space is different from the textual drift that Barthes is pointing toward. Barthes words seem to reflect a particular set of qualities that relate to the experience generated within a virtual environment. In the work *The World Generator/The Engine of Desire* the notion of drift is both literal and metaphorical. Objects float in the illusionistic space of the virtual environment and move as if motivated by some behaviour or driven by a current. Navigation within the work is suggestive of being propelled under water. This forms a pun on navigation — referring to actual navigation as well as virtual navigation. It is this very practice of "drift," interactively actuated within systems of non-hierarchical navigation, that is facilitated through technological means. The *vuser* of the system drifts and navigates through media-elements, forming a time-based perceptual accreted perception of the environment. "Perceptual interweaving" (Barthes, 1975, p.64) is heightened as a "generative" experiential feature of the computer-based mechanism. The interactivity of the *vuser* actually defines alternate and/or multiple trajectories through the landscape of media-elements, forming a set of shifting, transitory "tissues" (Barthes, 1975, p.64) of media experience. This interweaving functions not only in relation to text. This "world" presents an inter-operative set of pressures or forces where elements of image, text and sound, qualify each other.

It is interesting to note that the word Cybernetics actually stems from aspects of navigation:

"Cybernetics, a word coined by Norbert Wiener to describe the complex of sciences dealing with communication and control in the living organism and in the machine." When Wiener introduced the term, which is derived from the Greek ... meaning governor or steersman, he was unaware that it had already

had a considerable history and that it had been used more than a century before by Andre Ampere to cover the purely governmental side of such a theory, in the positivistic classification of scientific theories.

As a matter of fact not only Ampere... but Plato had used the word... (which would be transliterated as "cybernetics") in *Gorgias*. Although Plato used the word more or less in relation to the art of navigation, it is highly interesting, as pointed out by Watanabe, that Plato compared cybernetics with rhetorics because he viewed both as concerned with influence and control entirely different in nature from knowledge of some fixed reality such as astronomy or geology. (Wiener, 1985, p.215)

The techno-poetic mechanism is also concerned with specific kinds of "communication and control in the living organism and in the machine." (Weiner, 1948) The work is a responsive mechanism — specific visual and sonic feedback has been authored into the device. Where the word "control" has negative connotations, I have, alternately, empowered the *vuser*, enabling "control" and navigation within a computer-based mechanism. The fact that the word "cybernetics" derives from "governor or steersman" is relevant in relation to the navigational properties of the device. It is also interesting to observe the allusion to Plato, concerning "rhetorics." The fact that Plato viewed cybernetics and rhetorics as both being concerned with influence, control, and knowledge, and that this was different from some "fixed" reality, is also central to an understanding of this operational system of observation. It is the unfixedity of my environment that enables us to observe the nature of mutability. The possibility for metamorphosis is authored into the device. We navigate this environment of perpetual metamorphosis as a particular approach to emergent meaning production.

1.2.16 Potentiality, Chance and Probability

During poetic construction and navigation, there is a statistical probability of an encounter for every media-element and process that I have mentioned in this paper. There is also a probability that the *vuser* will employ a particular media-element in the construction of a world. These two examples of probability are directly linked to emergent experience. The media-element-configurations that arise through use of the techno-poetic mechanism, form a layered set of tissues of potential.

"Perceptual interweaving" (Barthes, 1975, p.64) in virtual reality, transcending the realm of written text that Barthes was alluding to, is heightened as a "generative" experiential feature of the techno-poetic mechanism. The environment is both generated through interaction with the mechanism, as well as "worked out in perceptual interweaving." (Barthes, 1975, p.64) The interactivity of the *vuser* actually defines alternate and/or multiple trajectories through both the "text" elements, and other media-

elements in the environment, forming a set of shifting, transitory probabilistic "tissues." Relevant to the probabilities made operative within the system is the notion of potentiality. Jean-François Lyotard in *Driftworks* states:

What is important in a text is not what it means, but what it does and incites to do. What it does: the charge of affect it contains and transmits. What it incites to do: the metamorphoses of this potential energy into other things-other texts, but also paintings, photographs, film sequences, political actions, decisions, erotic inspirations, acts of insubordination, economic initiatives, etc. ... (These Essays) their content is not a signification but a potentiality. (Lyotard, [date not set], p.10)

The techno-poetic mechanism, functioning as a generative device produces meanings, as it "incites" one to become behaviourally engaged with the potentials of interaction. Once the *vuser* has partaken in the construction of a virtual world, their understanding of this experience can possibly be reapplied to other contexts and to the understanding of other experiences.

I will focus on an exploration of potentiality as brought about through the combination and recombination of "fields of meaning." Eco from *The Open Work* provides a perspective on the concept of "possibility" inherent to the techno-poetic mechanism :

The notion of "possibility" is a philosophical canon which reflects a widespread tendency in contemporary science; the discarding of a static, syllogistic view of order and a corresponding devolution of intellectual authority to personal decision, choice and social context.

If a musical pattern no longer necessarily determines the immediately following one, if there is no tonal basis which allows the listener to infer the next steps in the arrangement of the musical discourse from what has physically preceded them, this is just part of a general breakdown in the concept of causation. The two-value truth logic which follows the classical aut-aut, the disjunctive dilemma between true and false, a fact and its contradictory, is no longer the only instrument of philosophical experiment. Multi-value logics are now gaining currency and these are quite capable of incorporating indeterminacy as a valid stepping-stone in the cognitive process. In this general intellectual atmosphere, the poetics of the open work is particularly relevant: it posits the work of art stripped of necessary and foreseeable conclusions, works in which the performer's freedom functions as part of the discontinuity which contemporary physics recognizes, not as an element of disorientation, but as an essential stage in all scientific verification procedures and also as the verifiable pattern of events in the subatomic world. (Eco, 1989, pp.14-15)

The techno-poetic device houses numerous chance¹ processes, as *performative* menu choices — *Random-object*, *Random-image*, *Random-text*, *Random-behaviour*, *Random-world* and *Random-all* are different chance-oriented selections the *vuser* may select in generating a media-world.

The *Random-all* and *Random-world* processes are achieved through the employment of elaborate algorithmic procedures. These procedures are enabled through finely articulate computer code and computer-based random number generators used to select complex configurations of media-elements and processes. Outcomes are derived by having the computer make a series of automated choices from variable sets; that is, the computer operates on the media-collection authored into the system, assembling a complex series of processes to derive an entire media-environment without the overt participation of the *user*. Computers are never entirely random, and I have further "loaded the dice" by exploring algorithmic processes that choose a random number within a chosen range, which in turn chooses a media-variable or media-process that acts upon or in conjunction with that variable. I have also loaded the dice by including specific media-variables as part of the system.

In a text entitled *Generating and Organising Variety in the Arts*, Brian Eno points toward a related concept.

I shall be using the term variety frequently in this essay and I should like to attempt some definition of it now. It is a term taken from cybernetics (the science of organisation) and it was originated by W. R. Ashby. The variety of a system is the total range of its outputs, its total range of behaviour. All organic systems are probabilistic: they exhibit variety and an organism's flexibility (its adaptability) is a function of the amount of variety that it can generate. (Eno, 1976, pp.279–283)

The techno-poetic mechanism, as stated above, is a self-organising, organism like system. This kind of "variety" of output potentially brings about the generation of emergent meaning. Eno elaborates on how he sees this notion of "variety" functioning in relation to experimental music:

My contention is that a primary focus of experimental music has been toward its own organisation and toward its own capacity to produce and control variety and to assimilate "natural variety" — the "interference value" of the environment. Experimental music, unlike classical (or avant-garde) music, does not typically offer instructions toward highly specific results and hence does not normally specify wholly repeatable configurations of sound...

I hope to show that an experimental composition aims to set in motion a system or organism that will generate unique (that is not necessarily repeatable) outputs. This is a tendency toward a "class of goals" rather than a particular goal and is distinct from "goalless behaviour" (indeterminacy) idea that gained currency in the 1960s. (Eno, 1976, pp.279–283)

The techno-poetic mechanism functions as a self-organising "variety" generator, seeking to generate emergent meaning as a probabilistic "class of goals," It paradoxically achieves this through goal-less play. The notion of "potentiality" is

literally explored in my work since it facilitates alternate combinations of media-variables. The focus here is on the generation of context, in which interaction drives the potentiality in different ways. Construction processes are also relevant to general computer-based multimedia and hypertext usage. We can not ever say for certain what configuration will arise. We can only posit that there is a particular probability of combination. It is the immense statistical variability of this probability, functioning in conjunction within an environment that houses particular media-elements and highly considered processes, that, in turn, enables the generation of emergent meaning.

The logic of uncertainty and qualitative probability are at play. The possibilities are so vast that we need not seek an interpretation of the work — a singular interpretation can not be fixed. To paraphrase Peirce, meaning is that which the sign conveys. I have made a rotating *conveyor* of potential permutations. The configurations of recombinant signs are continuously exchangeable. The language-vehicles inherent to the system can always be literally and metaphorically set in motion. This is where any system that seeks to codify language use will fail. Meaning resists both closure and fixity, although we can approach it, point at it, talk about it, and seek to elucidate it.

1 See the paper by George Brecht entitled "Chance Imagery," 1966, for a thorough examination of chance related processes in the arts.

1.2.17 Games and Play

The techno-poetic mechanism is like a game without outwardly specified rules. Wittgenstein in *Philosophical Investigations* articulated language use as a form of "language game:"

But how many kinds of sentence are there? Say assertion, question and command? There are countless kinds; countless different kinds of use of what we call "symbols," "words," "sentences." And all this multiplicity is not something fixed, given once and for all; but new types of language, new language-games, as we may say, come into existence and others become obsolete and get forgotten. (We can get a rough picture of this from changes in mathematics).

Here the term "language game" is meant to bring into prominence the fact that the speaking of language is part of an activity, or a form of life. (Wittgenstein, 1958, p.11)

It is possible to say that it is an operational "mathematics" which in part gives rise to virtual reality, reflects incredible "changes in mathematics" as embodied within computer-based environments. Wittgenstein describes the necessity of using the term "language-games" in that "language is part of an activity, or of a form of life." As life

changes through the creation of new technologies, concomitantly, new means of expression and communication are born — the nature of "language-games" extended. I am seeking to enable play in what might be called "the computer-based emergent meaning game." I have extended the play to include various media-elements as meaning-vehicles within this game. This process oriented game continues to point at the fact that "this multiplicity [of use, emphasis Seaman] is not something fixed, given once and for all." As stated previously, the techno-poetic mechanism is a technological pointing mechanism, opening an experiential window onto the nature of language-vehicle "use" within a specific generative virtual environment.

My device presents a new form of language game. One enters the environment and "begins to play." Saussure made the following observation comparing a game of chess to language use (pre-dating Wittgenstein thoughts on language games):

But of all the comparisons that might be imagined, the most fruitful is the one that might be drawn between the functioning of language and a game of chess. In both instances we are confronted with a system of values and their observable modifications. A game of chess is like an artificial realization of what language offers in a natural form. (Saussure, 1959, p.88)

It is just this type of relation, between chess and language, that I seek to extend through the exploration of the mixed-semiotic landscape of language-vehicles. I have specifically alluded to chess within the choice of media-elements. The key is the operative game-like nature of the process, which is inherent to interaction with the techno-poetic device. Roy Ascott in the text *Behaviourist Art and the Cybernetic Vision* suggests the following about games and play:

The participatory, inclusive form of art has as its basic principle "feedback," and it is this loop which makes the triad artist/art work/observer an integral whole. For art to switch its role from the private, exclusive arena of a rarefied elite to the public, open field of general consciousness, the artist has had to create more flexible structures and images offering a greater variety of readings than were needed in art formerly. This situation in which the art work exists in a perpetual state of transition, where the effort to establish a final resolution must come from the observer, may be seen in the context of games. We can say that in the past the artist played to win and so set the conditions that he always dominated the play. The spectator was positioned to lose, in the sense that his moves were predetermined and he could form no strategy of his own. Nowadays we are moving toward a situation in which the game is never won. But remains perpetually in a state of play. While the general context of the art experience is set by the artist, its evolution in any specific sense is unpredictable and dependent on the total involvement of the spectator. (Ascott, 1966, p.2)

It is the nature of play, articulated by Ascott, that enables the *vuser* to generate emergent content, in an ongoing manner. The game continues... it is never won. The definition

of games is exploded because the set which includes "games" is extremely inclusive. Wittgenstein knew this when he employed the term. The question is, How can something that is gamelike generate emergent meaning?

One of the most interesting observations that can be made about play is the fact that the object or situation that is being acted upon is sometimes not the object or situation that in fact exists. A bridging can exist between the actual space and the object of the mind's eye; the real object/situation functions as a jumping off point for the imagination. We might call this imaginary world a "virtual thought world" in that its existence is only in the mind, even while two or more people function within a "play" environment.¹ A shared or consensual "virtual" context with fluid boundaries of change, becomes an environment of intimate symbolic exchange. How is this observation relevant to computers, functioning as environments for symbolic exchange? Rules are central to both computers and games. If an environment is predicated on a shifting rule base, how can an individual function? Many people would lament this form of shifting or non-defined rule base, but in the realms of play and poetics this environment can enable various qualities of engagement that far exceed standard rule-based exchanges. The environment enables an open interpretation to behavioural relevance. In fact it is this very quality of unfixity that enhances engagement for the participant and drives the potentialities of emergence. The *vuser* takes an active role in the construction of a conceptual bridge between imagination and actual physical behaviour. The fluid nature of the environment's mutability makes it, at times, quite ephemeral. The actuality of virtual environments seems to hover between the "real" and the "imaginary." This conflation is central to the nature of free form play. Along with play we could also say that this state — where a participant intermingles the eye with the mind's eye, bridging the imaginary, memory and the real — is central to learning. Beneath the surface of this open game is highly complex enabling computer-code.

Carse in *Finite and Infinite Games* presented a series of relevant game related concepts. These can be applied to an understanding of the techno-poetic mechanism: "There are at least two kinds of games. One could be called finite, the other infinite." (Carse, 1986, p.1) The techno-poetic mechanism is an example of an infinite game." A finite game is played for the purpose of winning, an infinite game for the purpose of continuing the play." (Carse, 1986, p.1) There is no winning involved in the techno-poetic mechanism. "Infinite players cannot say when their game began, nor do they care. They do not care for the reason that their game is not bounded by time." (Carse, 1986, p.6) This can be related to Bateson's definition of the "plateau," which one enters in the middle and "whose development avoids any orientation toward a culmination point or external end." (Deleuze and Guattari, 1987, p.22) Carse went on

to say, "There are no spatial or numerical boundaries to an infinite game. No world is marked with the barriers of infinite play and there is no question of eligibility since anyone who wishes may play an infinite game." (Carse, 1986, p.6) The techno-poetic mechanism is a volatile, mutable space, paradoxically both bounded and boundless. "While finite games are externally defined, infinite games are internally defined. The time of an infinite game is not world time, but time created within the play itself. Since each play of an infinite game eliminates boundaries, it opens to players a new horizon of time." (Carse, 1986, p.6) The techno-poetic mechanism does have its technical limits, while simultaneously it seeks to explore an open relation to time. I have sought to suspend time during participation; the user can become lost into the horizon of time within this work. Only the interruption of others wanting to play disrupts this timelessness. "For this reason it is impossible to say how long an infinite game has been played, or even can be played, since duration can be measured only externally to that which endures. It is also impossible to say in which world an infinite game is played, though there can be any number of worlds within an infinite game." (Carse, 1986, p.6) The virtual world can be conjoined/networked to other copies of the techno-poetic mechanism, running in different locations internationally. It is paradoxically poly-locational in the physical sense, because it can be virtually inhabited in geographically distant locations. It continues where it left off in any new showing. "The rules of an infinite game are changed to prevent anyone from winning the game and to bring as many persons as possible into the play." (Carse, 1986, p.8)

There are, outwardly, no fixed rules to the use of the techno-poetic mechanism. The individual defines their own particular use for the system. I always hope for there to be future engagements — future showings of the work. "The rules, or grammar, of a living language are always evolving to guarantee the meaningfulness of discourse, while the rules of debate must remain constant." (Carse, 1986, p.10) The techno-poetic mechanism seeks to be a discourse mechanism, one that observes evolution in action. The gaming involved in the techno-poetic mechanism is played out within an evocative, emergent landscape of potential media-relations. An abstract game involves the constant use of symbolic reasoning, as the player becomes engaged in the generation of an environment of meaning-relations, the virtual and the real are co-mingled. The game-like nature of the space is highly engaging, but as the game is played out, additional significances arise. This forms another plane of emergent meaning.

1 See also Laurel, 1991, on the subject of play in *Computers As Theatre*.

1.3 Focus Areas Informing the Construction of the Techno-Poetic Mechanism

In the following section I develop a series of focus areas that are relevant to the project, in terms of an exploration of emergent meaning. These foci have arisen as a product of the research. Although the focus areas may seem tangential, adding additional text to this document, they contribute to the overall goal — the exploration and examination of emergent meaning within a generative virtual environment.

1.3.1 Re-Embodied Intelligence: An Approach to the Translation of High-Level Artistic Processes into a Computer-Based Operative Environment

The techno-poetic mechanism presents a cyber-polysemic space that heightens the potential for an intermingling of the mind-set of the *vuser* with the "re-embodied intelligence" of an author or authors, enabling the *vuser* to engage with specific thought "artefacts" housed and/or generated by the system. Central to this interaction is an experience unique for each participant. Given that computers can house recombinant digital elements of image, music/sound and text, I have become an author of a responsive, self regulating system that can enable an "intelligent" emergent poetic response to user interactivity through the encoding, mapping and modelling of operative poetic processes. A re-embodied intelligent system is nested as a sub-system in the techno-poetic mechanism. I have described two re-embodied intelligent functions — the *Random World* function and the *Random All* function in the chapter "Potentiality, Chance and Probability."

The computer enables not only the production of an image but the experience of an entire range of artistic processes, that is, the automated writing of a spatial poem, the automated composing of a recombinant piece of music and the automated construction of a virtual landscape — in all, the complete construction of a complex virtual world¹. I am seeking to articulate a broad practice of algorithmic production, one in which transdisciplinary fields become interwoven and nested as a set of processes within the techno-poetic mechanism, enabling the conflation of the language-vehicles of text, image and music/sound — as one algorithmic subset housed within a recombinant poetic-mechanism.

I am interested in interactive art works that exhibit "intelligent" responsiveness to user input. In *Thinking Machines, The Search for Artificial Intelligence* by Igor Aleksander and Piers Burnett, the authors state:

Rather than becoming embroiled in the controversies which surround the nature of human intelligence, the practitioners of artificial intelligence have generally chosen to define their goals in empirical or operational terms rather than theoretical ones ... The researcher simply chooses a task that seems to require intelligence (playing chess say or recognising visual images) and tries to build a machine that can accomplish it." (Aleksander, 1987, p.13)

This definition becomes extended (or blurred) in terms of responsive "intelligence" in a work of art. Some would suggest that "intelligence" can not be defined.² We must be careful to differentiate the kind of "intelligence" exhibited by my artistic mechanism, when we compare it to "intelligence" examined through the "Turing Test." (Turing, 1992) The value of the "Turing Test" to determine intelligence may be seen as relevant to particular contexts, but for the purposes of art content may be completely irrelevant. An art work may explore any approach that the author (or authors) finds "intelligent." The ultimate test relies on whether the *vuser* feels that the system has achieved an intelligent responsiveness or produces an "intelligent" artistic outcome. A system may appear to be non-functional, silly, ironic, stupid, humorous, tragic, overtly sexual and so on — any form appropriate to the individual's aesthetic. In terms of re-embodied intelligence, the artist is not trying to "fool" someone into believing the machine is thinking. The artist is attempting to translate intelligent processes along with particular kinds of computer-based responses and/or behaviours, into computer-based environments, so that during interaction, artefacts are produced as an active extension of the mind-set of the programmer/artist. These artefacts can be experienced by the *vuser*, generating emergent content. In *The World Generator/The Engine of Desire*, the goal is to generate emergent meaning. When the processes of re-embodied intelligence are activated, they function in the manner of the artist/author *without the presence* of that artist/author³, generating new art production, a specific response based upon *vuser* input. This "intelligent" outcome is related to, but different from, any previous construction made with the mechanism. Thought, historically, becomes embodied in actions and artefacts. Codified and translated into the machine, thought then becomes re-embodied and functions as a producer of actions and artefacts in the manner of the artist/author. The constructions created by the code is an embodiment of Thought's agency. The processes brought about through this re-embodied thought functions — in the absence of the author — as re-embodied intelligence.

In seeking the origins of the concepts which have come to enable this art practice,

we can make a "genetic" analogy to the principles which enable the functioning of the Jacquard Loom. We can trace the genealogy of the computer from the initial patterns of weaves facilitated by this particular loom to the fabric of contemporary communication — images and texts comprised of pixels. Recombinant poetic works are made operative within systems which propagate the inter-authorship of the programmer and artist, by means of symbolic logic. The result of this endeavour is finally manifested on the outermost level of the system of representation, as recombinant configurations of light and sound. Modular visual and textual elements operative within this technological system have a punning function in relation to that system; outwardly they communicate to the user artistic content, while inwardly they perform as the functional connection to encoded symbolic logic. Hamilton and Bonk provide this perspective:

A computer language is a notation for the unambiguous description of computer programmes. Such languages are synthetic in their vocabulary; punctuation, grammar, syntax and semantics are precisely defined in the context of a particular operating system. They suffer from an inability to cope with autonomous expression — an essential attribute of an organic language. The poetic of computers lies in the genius of individual programmers to express the beauty of their thought using such an inexorable medium. (Hamilton & Bonk, 1997, p.309)

In the light of the techno-poetic mechanism, if one can generate an entire poetic virtual world in the manner of the artist, I would consider this an "intelligent" machine-based process; but, here there is no emulation of thought, as there is in artificial intelligence — just an abstraction or codification of thought re-embodied in the machine through this "inexorable medium" of computer language. We see the seeds of re-embodied intelligence within the Jacquard loom, which has been described as exhibiting "the selective powers of the human brain and the dexterity of living fingers." (Blum, 1970, p.41) The person who encodes the punch card "re-embodies" an aesthetic conception into a "language" which the analogue machine can read. In *The Loom Has A Brain*, Blum states: "Each has a meaning as to weave effects and color selection and these all have to be translated so that the loom understands them." (Blum, 1970, p.44)

This description shows one early relevant example of the translation of aesthetic practice to a machine-mediated process. We can extrapolate this idea in terms of contemporary computer-art practice, making a direct analogy to the punch cards functioning as "conceptual machines" within the analogue mechanism of the loom, to the software/hardware paradigm in computers, in which the code functions as a vehicle of the translated aesthetic conceptions of the artist. I will elaborate on this concept of the conceptual machine in the following surveys.

Once a chosen "intelligent" process has been translated, the machine can perform "intelligent" functions in the manner of the author, producing unique new works of art in conjunction with the interaction of a user or as a stand-alone procedure. The machine functions as an extension of the author's sensibility, presenting an environment for another mode of inter-authorship, that is, through *vuser* interaction. Unlike much algorithmic art production, I am seeking to intermingle this process with other interactive processes, thus conflating levels of authorship, inter-authorship and machine authorship as produced through particular examples of re-embodied intelligence.

Computer-based environments facilitate states of authorship. In computer-mediated interactive art work, a *vuser* can intermingle with the operative elements of the system and interact with them through authored feedback mechanisms. The *vuser* can enter into a conceptual "dialogue" with "artefacts of thought," which the initial author or authors have encoded in the system; as well as, the *vuser* can operate in connection with the artefacts of inter-authorship that may be housed in a particular environment.

Simon Penny suggests that this concept is problematic:

Here the basic incompatibility of computer systems with art practice is thrown into high relief, for elaboration of a canon is simply elaboration, while it is the quality of invention that we value in Art. Invention is not random; it is based on the analysis of canons and codes and on the inversion of terms. The computer process just generates possibilities, the subtle assessment of the value among the choices is beyond the capability of the machine. We may posit a rule system for making choices, but this system will be grounded in another set of assumptions that are held stable. In artistic invention, this set of assumptions would itself come under scrutiny. This situation results in infinite regress when framed in machine hierarchical terms. But in human culture the relation between sets of rule systems is not one of nesting but weighting of terms in a matrix that folds in on itself. (Penny, 1995, p.57)

In my project I have avoided the problem that Penny formulates, in three ways: I have loaded the system with specific media-elements, carefully "weighing" the potentials of these elements, imbuing the system with a designated range of pre-authored "aesthetic" values; I have carefully orchestrated the way these media-elements are parsed and positioned in virtual space; and I have explored chance methods, within particular ranges, thus heightening the probability of certain events. The media-elements can also be explored in a non-hierarchical manner by the *vuser*, as a separate function.

In tracing the genealogy of ideas related to recombinant poetics, the "notes" of Ada Lovelace prove central. Her work with Charles Babbage's *Analytical Engine* in the 1800s explored the manifestation of symbolic logic through the encoding of punched cards, a direct outgrowth from the Jacquard loom. The punched cards of the

"analytical engine" function as a "translation" and encoding of symbolic language and can function as a conceptual machine within a "physical" one. This is analogous to the hardware/software paradigm. "We may say most aptly that the Analytical Engine weaves algebraical patterns just as the Jacquard-loom weaves flowers and leaves." (Babbage, 1961, p.245) I have pointed to Derrida, Barthes and Kristeva's interest in textiles as a metaphor for language use. The computer presents an environment for the exploration of the electronic-textile of emergent meaning. I am also reminded of the sensually layered textile veils alluded to by Peirce. (Peirce, 1931, p.171)

What better place to observe the process of Semiosis than within the mutable confines of a generative virtual environment. Lovelace had a clear vision of the potentialities of the computer. In her *Notes by The Translator* (Babbage, 1961, p.249) (written to clarify the work *Sketch Of the Analytical Engine Invented by Charles Babbage* by L. F. Menabrea), we see foci that are valuable to the construction of a device to explore emergent meaning — the ability to perform multiple operations upon chosen abstract entities and, as well, the potential of those entities to be aesthetic in nature; that is, a machine might act upon and compose and perform "music." Also relevant to the production of emergent meaning is the pun. Lovelace chose the word "translator" in her title, which in this instance could refer to her being the literal language translator of text by L. F. Menabrea, a "translator" of thought into readable code as in the analytical engine and the translator of Babbage's ideas about the analytical engine into an understandable as well as extended form. Her enlightened notes were published in 1842, almost 100 years before Turing picked up on its potential ramifications.

1 Note: artists and theorists have studied algorithmic approaches to art production including the writing of music, both prose and poetic texts, as well as the use of the computer to produce paintings and drawings. A complete study of artists exploring algorithmic methods falls outside the scope of my project i.e., see Harold Cohen's AARON (Kurzweil, 1992, p.357), and the beautiful drawings, paintings and prints of Roman Verotsko.

2 Ted Krueger in a conversation with Seaman has openly doubted that intelligence can be defined.

3 See Derrida discussing absence in "Signature Event Context" in *Limited Inc.* (Derrida, 1988).

1.3.2 Nonsense Logic

I have outlined the notion of "re-embodied intelligence" and I will now examine a particular aesthetic sensibility that feeds into that methodology. Given the emergent interactive environmental context generated through re-embodied intelligence, I am seeking to explore particular aspects of pointed nonsense as artistic content (among other aesthetic explorations) to generate emergent meaning. There is a poignant irony to the fact that the computer, a mechanism entirely predicated on symbolic logic, can be used to explore non-sense as well as illogical and elusive resonant artistic content. An interactive work of art can be seen as an organism-like vehicle of content that is both generated and experienced through interaction. In this case, aspects of meaning are approached through particular focused nonsense relations.

If one looks historically at the use of nonsense in literature and other forms of art, we find a fertile realm of creative exploration. How can our understanding of nonsense be applied to the realm of interactive art as well as symbolic logic? Here, Lewis Carroll becomes an interesting subject for investigation. He both authored texts about logic as well as texts exploring nonsense. Certain of these texts include metalanguage employment, as in *Alice in Wonderland*. (Carroll, 1977) Relevant to my project, he also explored diagrammatic approaches to the elucidation of logical structures. Deleuze articulates his views on the musings of Carroll, in *The Logic of Sense*:

The work of Lewis Carroll has everything required to please the modern reader: children's books or rather, books for little girls; splendidly bizarre and esoteric worlds; grids; codes and decodings; drawings and photographs; a profound psychoanalytic content; and an exemplary logical and linguistic formalism. Over and above the immediate pleasure, though, there is a play of sense and nonsense, a chaos-cosmos... The privileged place assigned to Lewis Carroll is due to his having provided the first great mise en scène of the paradoxes of sense — sometimes collecting, sometimes renewing, sometimes inventing and sometimes preparing them. (Deleuze, 1990, p.xiii)

One goal of the use of computer systems is to come to better understand ourselves. This potentially includes addressing the paradoxes of nonsense within a computer-based environment. Computers can function as mechanisms of discourse, enabling the exploration of embodied models made operative through interactive mechanisms. Through the exploration of nonsense, we can witness a contrasting critique of sense within the computer-based context. The subtle displacement of a particular element from a selected context can actually help to illuminate aspects and/or qualities of functionality. In the *Philosophy of Nonsense* by Jean-Jaques Lecercle, the author provides this perspective:

My thesis...is that the negative prefix in "nonsense" ... is the mark of a process not merely of denial but of reflexivity, that non-sense is also meta-sense. Nonsense texts are reflexive texts. This reflexion is embodied in the intuitions of the genre. Nonsense texts are not explicitly parodic, they turn parody into a theory of serious literature; [for example] Lewis Carroll's metalinguistic content on points of grammar ... (Lecerle, 1994, p.2)

A nonsense statement can potentially release a "reflexive" field of readings. The playful use of a pun is one example. As the meaning forks into a field of alternate readings and the relations between those readings, an elaborate conceptual process is set into action in the mind of the reader/vuser .

One can observe the employment of nonsense in computer-based works, as setting out a complex field of emergent potential readings. Nonsense relations inform our understanding of reality just as sense relations do. It is this relation between sense and nonsense that I seek to explore, wherein the use of nonsense becomes self-referential, communicating simultaneously about a particular authored context while also "throwing off" or playing with that context. In this way non-sense can function as "meta-sense" and consequently produce a complex form of emergent meaning. In his book *The Logic of Sense*, Deleuze articulates this relation:

The play on words would be to say that nonsense has a sense, the sense being precisely that it doesn't have any. This is not our hypothesis at all. When we assume that nonsense says its own sense, we wish to indicate, on the contrary, that sense and nonsense have a specific relation that can not copy that of the true and the false, that is, which can not be conceived simply on the basis of a relation of exclusion. This is indeed the most general problem of the logic of sense: what would be the purpose of rising from the domain of truth to the domain of sense, if it were only to find between sense and nonsense a relation analogous to that of the true and false? ... The logic of sense is necessarily determined to posit between sense and nonsense an original type of intrinsic relation, a mode of co-presence. For the time being, we may only hint at this mode by dealing with nonsense as a word which says its own sense. (Deleuze, 1990, p.68)

If one thinks of the computer as often being predicated on a binary logic¹ of true/false, yes/no, on/off, then in a specific sense I am trying to approach more delicate and subtle modes of communication and intellectual exchange through the playful and pointed employment of nonsense. Nicholas Rescher in his book entitled *Many-Valued Logic* elaborates on a particular pluralistic perspective in terms of an understanding of logic:

The very idea of truth-values other than the two orthodox truth values of truth and falsity is obviously central to the conception of a "many-valued" logic. To obtain such a logic, we must contemplate the prospect of propositions that are neither definitely true or definitely false, but have some other truth status such as indeterminate or neuter. [or other, emphasis the author] (Rescher, p.2, 1969)

In terms of the techno-poetic mechanism, I am examining the term "logic" as a compression of logics — a pun on logic — where multiple logics are compressed and made operative within a mechanism that bridges and enfolds the textual, the musical, the sonic and the imagistic, functioning as meaning-vehicles within an experiential computer-based environment. This multi-logical system explores the following logics:

- a logic of nonsense
- a psychological logic
- a physiological logic
- a machinic logic
- a logic of virtual mechanisms and/or conceptual machines
- a logic of economy
- an aesthetic logic including:
 - a sonic logic
 - a pictorial logic
 - a linguistic logic

These logics are made operative within a compressed, shifting, meta-logical mechanism.

By developing a computer-based mechanism that explores pointed nonsense as its content, we come to better understand the complexities of context construction. It is often the nonsense text, that, through displacement, opens up a new relation, a re-seeing of the original context, a form of active comparison built into, or compressed within, the conveying environment. The techno-poetic mechanism provides a set of interactions that can then potentially enable a re-seeing or re-understanding of sense/nonsense relations external to the work:

Fixing this distance between the text of social life and the artistic text is a matter of determining the shape of an inter-textual relationship — will the artistic text mirror the text of social life, will it distort the other text, reflect it, replicate it, reverse it, or multiply it? These are all questions of verisimilitude or *vraisemblance*; how is it that the text can gesture toward, make reference to, be construed as, a "real world"? (Stewart, 1979, p.18)

I have earlier pointed to Kristeva's notion of intertextuality (Kristeva, 1984, p.60) related to the techno-poetic mechanism. The permutations inherent to recombinant structures present a situation in which nonsense relations can arise and/or be intentionally initiated. Each media-element in the techno-poetic mechanism has a potential meaning force. By exploring media-elements carrying condensed content, or

multiple potential readings, the meaning-force of these elements paradoxically pushes in multiple directions simultaneously.

It is relevant to note Freud's attempt to "grasp" and define a pertinent list of joke techniques in the book *Jokes and Their Relation to the Unconscious*. He elaborates on this notion of double and multiple meaning. He describes "Multiple use of the same material... in a different order," (Freud, 1960, p.42) as one particular joke technique. He also examines the following:

Double meaning:

- (g) meaning as a name of a thing,
- (h) metaphorical and literal meanings,
- (i) double meanings proper (play upon words),
- (j) *double entendre*,
- (k) double meaning with an illusion. (Freud, 1960, p.42)

Each of these foci is relevant to meaning construction within the techno-poetic mechanism and can also be witnessed in the elucidation of the device in this paper. Double or multiple meanings are embodied as compressed "fields of meaning"² in this work and nonsense can manifest these multiple functions and/or malfunctions.

In a world wherein obvious complexity presents situations that can not simply be read as true or false, the specific employment of nonsense logic functions in the techno-poetic mechanism as a contrasting conceptual perspective mechanism, functioning in counterdistinction to more traditional forms of logic. The emergent meaning arising from the exploration of this pointed nonsense is potentially a meta-meaning. My operative recombinant poetic environment enables the exploration of emergent fields of meaning through the active engagement of authored-media elements and processes. The non-linear experiential examination of nonsense-logic also presents an alternative to the hierarchical logic upon which computers are most often predicated. In terms of exploring emergent meaning, the employment of nonsense-logic, *makes sense*.

1 See Kosko, 1994, for an extended look at Fuzzy Logic.

2 See the notions surrounding "Dreamwork" and "Meaning Compression" in *The Interpretation of Dreams*. (Freud, 1970)

1.3.3 Puns

Extending the exploration of emergent meaning and related to Nonsense Logic, is the pun. Puns function primarily as a vehicle of potential content compression in the techno-poetic mechanism. Particular media-elements function as language engines, carrying and enabling, through interaction and juxtaposition, access to multiple interpretations. The project seeks to posit a punning discourse. Derek Attridge in his text *Unpacking the Portmanteau, or Who's Afraid of 'Finnegan's Wake'?* states:

In spite of its dangerous tendency to polysemy, language works well enough, we are told, because of its appearance in a disambiguating context: we are able to choose one of several meanings for a word or sentence because we are guided by the immediate verbal surroundings, the nature of the speech act in which the words are uttered and perceived, the social and historical setting and so on. As speakers we construct our sentences in such a way as to eradicate any possible ambiguities and as hearers, we assume single meanings in the sentence we interpret. The pun however is not just an ambiguity that has crept into an utterance unawares, to embarrass or amuse before being dismissed; it is ambiguity unashamed of itself and this is what makes it a scandal and not just an inconvenience. In place of a context designed to suppress latent ambiguity, the pun is the product of a context deliberately constructed to enforce an ambiguity, to render impossible the choice between meanings, to leave the reader or hearer endlessly oscillating in semantic space. (Culler, 1988, p.141)

My experiential techno-poetic mechanism seeks to explore how meaning arises in relation to a contemporary electronic-media context, where the user of the system can observe decontextualisation and recontextualisation first hand. By loading the mechanism with puns — verbal, visual and sonic — I have intentionally pointed toward questions of ambiguity. This is a pointed meta-ambiguity I seek to explore. Attridge employs the term "fields of meaning" within his text, related to this forking form of ambiguity. (I have earlier examined the notion of "Fields of Meaning — An Emergent Approach to the Perception of Context.") Attridge goes on to state that puns promote polysemy, a "feature characteristic of literary language." (Culler, 1988, p.144) I am particularly interested in the exploration of polysemy within this cyber-polysemic space.

I am also interested in the transdisciplinary co-mingling of divergent areas of research. In his text, *The Puncture In Grammatology*, Ulmer points toward the way a philosopher can draw from the artistic/poetic:

Two points need to be made at once: first the fact that Derrida decided to do philosophy (if that term still applies) with Joyce's rather than with Husserl's model of language. At a stroke he transformed with this move the status of aesthetic discourse in the hierarchy of the university mechanism from object of

study (powerless) to subject of knowledge - to a source of cognition to be applied to problem solving across the divisions of knowledge from anthropology to zoology. (Ulmer, 1988, p.169)

In a related way to Derrida and Ulmer, the techno-poetic mechanism seeks to employ punning, poetic language, exploring a polyvalent discourse. Ulmer's concept of the "Puncept," is highly relevant to my project. He calls this form of discourse "punceptual cognition."

Thomas Kuhn developed the notion of the "paradigm shift" to help account for the fact that sometimes "a law that cannot even be demonstrated to one group of scientists may occasionally seem intuitively obvious to another." Such a law central to the "post" paradigm, involves punceptual cognition... If it seems intuitively possible (if not obvious) that puncepts work as well for organizing thought as concepts (sets formed on the basis of similar signifiers rather than similar signifieds), then you are likely to possess a post-modernist sensibility. (Ulmer, 1988, p.164)

In the techno-poetic mechanism, content is made mobile through computer-based navigation and poetic construction. In fact the term *construction* functions on both a literal and metaphorical level within this discourse. The techno-poetic mechanism presents a charged environment, allowing for multiple resonant readings. It can be approached in a textual manner by making use of a set of very specific puns (see the poetic text included in the menu system of the techno-poetic mechanism, provided in the appendix of this document) to build a resonant reflective "rhizome." (Deleuze and Guattari, 1987, p.21) The techno-poetic mechanism is a kluged machine of interactive mechanisms, enabling a negotiation (another pun related to both navigation and conceptual processes) of potential content. The pun makes an intentional polyvalent meaning-field, positing a conceptual landscape of potential evocations, enabling an oscillation or circulation between alternate spokes of conveyance. This punning discourse becomes a resonance engine, shifting back and forth within the computer-based environmental context, posited, in most instances, through the textual [see the sound pun described in the notes to this section] and actuated within the virtual-experiential. A specific ambiguity¹ is sought, in the authoring of the collection of media-elements, lending access to an unfolding complexity related to each derived configuration.

Although the pun is popularly thought of as a slight and humorous linguistic mechanism, there is a significant history to its deployment, in particular in terms of the twentieth century avant-garde. This seriousness (or serious play) can be witnessed in the work of many of the writers described in the section of this document dealing with literary pre-cursors. The pun is a vehicle of "forked" meaning. It points in two or more

directions at the same time. It is relevant here to describe the chess term,² "fork." A fork in chess is a "meaningful" move in that it puts pressure on a series of contexts which are significant to the game, simultaneously. Culler in his book *Puns* states:

A finer tale links our word pun to "compact or pound," as in Troilus and Cressida: "He would pun three into shivers with his fists."³(Culler, 1988, p.3)

Culler continues,

To pun, writes Sheat, "is to pound words, to beat them into new senses, to hammer at our similes." (Culler, 1988, p.3)

I am interested in the generative economy of this force, not the brute physicality of it. Just as in the chess fork, the artist chooses a particular term because the compression is inherent to it. It is elucidated within a constructed or authored context. Construction mechanisms are central to the techno-poetic mechanism. The energy or "force" of the thought of the author is manifest in trace⁴ form in this construction process.

A chess fork generates a related oscillation where the opponent must look at one potential move, then another, then another, when a fork is initiated. A fork is a move which heightens a state of potential future moves. Although the game piece is singular in nature, the move activates a series of potential meanings for the opponent, suggesting different ways in which the trajectory of the game might go. As earlier stated, the techno-poetic mechanism exhibits a game like nature. Unlike chess, there are no defined rules for the participant.

I seek to compress potential meaning in the authorship of media-elements, to engage the active participation of the imagination and association of the *vuser*. The pun is one vehicle of engagement, active in the enfolded economy of work. We must remember that it is the associative properties of this device that becomes highly engaging. It is this combinatorial set of alternative conveyances that makes the work meaningful in a different way to each individual participant. We do not see the activity in the mind of the *vuser*, completing the work, ⁵ which is central to the operation and reception of this environment. Duchamp, a *punificator* himself, suggests that "The spectator brings the work in contact with the external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act." (Duchamp, 1989, p.140)

A pun potentially contains a contextual orientation as well as a decontextualisation fork. It works as a conceptual machine (see subsequent chapter on conceptual machines) on a small scale; it functions as an operative vehicle within the work, activating fields of potential meanings through the thought processes of the *vuser*. The techno-poetic

mechanism contains many conceptual machines which are working toward a potential resonant functionality — different for each *vuser*.

I have often incorporated puns in the description of systems found in my interactive art work, to reflect poetically upon the nature of active mechanisms inherent to the work. I am operating with an open definition of the word *pun*, one that includes both serious and playful use of the term. Historically this has related to words which have the same sound⁵ but carry different potential significations, homophones. Puns may also be explored in contexts in which texts are presented visually. In this case, the sound is not made audible except in the *minds eye* or should I say the *minds ear* of the *vuser*. The level of ambiguity signified by a selected word becomes the focus, where different contexts trigger more ambiguous or less ambiguous conveyances of potential meaning. The knowledge of the constructed context is a fleeting one, built with the intention of exploring multiple and shifting arenas of conveyance. Highly significant to the process are chosen sets of meanings which have a probability of being evoked.

Most often, the kind of pun applied in the techno-poetic mechanism explores alternate spokes of meaning elicited from the same word, although other forms of word-play are also in evidence. Derek Attridge, in describing lines in a book by Pope in a chapter of the book *On Puns* entitled *Unpacking the Protmanteau*, examines the polysemy of the word "port."

Where Bently late tempestuously wont to sport
In troubled waters, but now sleeps in port
(lines 210-2 from the Fourth Book of the *Dunciad*)

In most of our encounters with the word *port*, the context in which it occurs (verbal and pragmatic) suppresses large areas of its potential signification; Pope's achievement in this couplet is to leave unsuppressed two apparently incompatible fields of meaning — *port* as "harbor" and *port* as "wine" — by inventing a context in which both are simultaneously acceptable... Pope's lines do not release all the meanings associated with the word *port*, of course; there is little likelihood of a reader bringing into play the idea of "external deportment, carriage, or bearing" or "the left-hand side of a ship". The semantic movement initiated by Pope's couplet, though never-ending, is strictly controlled: the angel of reason dancing on a pun. If we should encounter the word *port* in a severely impoverished context — it appears on a scrap of paper pushed under the door, for instance, or is spoken in a dream — the range of meaning widens and the pleasure we take in its ambiguity disappears. No longer is language's potential for semantic expansion hinted at but simultaneously kept at bay; it has become threatening and confusing. Remove even more of the context and the expansion accelerates rapidly: imagine the word being encountered by someone who knows no English, or no Indo-European language, or no human language. Eventually its meaning becomes infinite and, at exactly the same moment, disappears. It is not surprising, therefore, that the pun is marginalized in our most common uses of languages. (Attridge, 1988, pp.141-143)

The techno-poetic mechanism enables an operative exploration of context. Differing states of meaning, as described above, at varying times are encountered. When Attridge describes the moment when a word's "meaning becomes infinite and, at exactly the same moment, disappears," he is describing one example of a particular meaning-state inherent to the techno-poetic mechanism, an instance where meaning becomes "exploded." In returning to the concept of linguistic *force*, it is important to make some generalisations. People want to find meaning and sometimes will consequently construct it, conceptually. My techno-poetic work seeks to engender a high level of engagement. If the *vuser* cannot understand some segment of the work, they potentially move to another plane of meaning where they either attempt to change it (the media-configuration) to make it meaningful to them - to correct the mistake, or they accept the non-sense within the context of the communication and see it as being germane to the poetics of the work, thus enabling a field of associations.

In the techno-poetic mechanism, there is always an intentional ambiguity. Historically, the richest works, to my mind, have activated fields of poetic ambiguity where each return to the work releases new meanings. The authorship of specific ambiguity became a goal in the construction of the work.

The question becomes, which of the above forks, as related to meaning processes, should one take as being relevant to a particular context? If the *vuser* encounters what they think is a *wrong* word (or media-element), they may continue to believe it is *wrong* and consider the artist to be *flawed*, or they may accept this *wrong* word (or media-element) as being relevant to the poetics, or they may take it upon themselves to change the word (media-element). The techno-poetic mechanism is operative and we can choose to edit in a substitution as an operative function within the work. The *vuser* is making up the rules of the game as they go along in response to particular linguistic (and media) *forces*. Central to the techno-poetic mechanism is the "negotiation" of these linguistic/media processes of decontextualisation, contextualisation and recontextualisation, making them meta-processes for the *vuser*, through experiential encounter. This meta-process of deciding how to approach varying language-vehicles becomes one layer of content within the work. "Port" becomes interesting to "unpack," in that we are seeking to examine the construction of meaning arising out of navigation and negotiation, not to mention an occasionally drunken sense of combination and re-combination.

Exclude the pun and you exclude the process on which all language rests: the process whereby context constrains but does not wholly constrain the possibilities of meaning.

We can approach the pun from another direction, from which we can again see it as a phenomenon which inhabits the normal procedures of language. The semantic fields of *port* in the sense of "wine" and of port in the sense of "harbor" have no evident synchronic connection. One's understanding of each normally remains uncolored by one's understanding of the other, because of the constraining effect of context already discussed. That is to say, they usually function as two quite different words; and it is an arbitrary quirk of the specific language system of English that associates them at all. Yet what Pope has done is to invent a context in which that arbitrary link comes to seem motivated: taking the language as he finds it, he has succeeded in shifting the world into a pattern in which harbors and wine are superimposed. The material envelope of the sign - its phonemes and graphemes - has been allowed to take the initiative and has brought about a coalescence of otherwise distinct fields of reference. This, of course, goes against all the rules: phonemes and graphemes should be servants, not masters; the mere coincidence of outward similarity should have no bearing on the meanings within. If this were not the case, language would never get off the ground - we would expect all words beginning with the same letter to be semantically related, for instance, or assume that historical or dialectal changes in pronunciation must entail changes in meaning. (Attridge, 1988, pp.142-143)

Language is always in the process of "getting off the ground," albeit a virtual plateau, in the techno-poetic mechanism. Each modular media-element functions relative to other selected elements, where each element (or constellation of elements) exerts a meaning *force*, shading and extending the meaning of the spatially-collaged configuration, relative to the neighbouring other. It is projected that the *vuser* becomes constantly engaged in building associative bridges between the elements. This process, potentially, is not discreet but functions in a continuous manner in relation to spatial proximity over time. The process may also function asynchronously: A later encounter with a particular term may have a conceptual domino effect, lending new readings to words, virtual objects and sonic elements which were earlier encountered. Central to the techno-poetic mechanism is the notion that the construction of meaning is process oriented and shifts from constructed context to constructed context. Attridge, here continues his discussion of the pun:

Outside the licensed domains of literature and jokes, the uncontrollable manifestations of parapraxes and dreams, the possibilities of meaning in a word are stringently limited by its context. The more that context bears down upon the word, the less the word will quiver with signification; until we reach a *fully* determining context, under whose pressure the word will lie inert, pinned down, proffering its single meaning... But at this point something else will have happened to it: it will have become completely redundant. The context will now allow only one meaning to be perceived in the gap which it occupies and anything — or nothing at all — will be interpreted as providing that meaning. (Attridge, 1988, pp.141-143)

In the techno-poetic mechanism, this is the particular situation I seek to avoid, in which meaning is shut down and there is little room for *vuser's* engagement in terms of association. An example is when we see an image and a word employed and both convey in a similar manner. In this instance, instead of engaging the *vuser*, the meaning collapses and becomes deflated. My device seeks to enable the exploration of shifting resonances which are both pre-constructed (a specific media-collection is employed in the work) and as altered through the construction of a context (the *vuser* takes an active role in the exploration of these *loaded* or pre-constructed media-variables through computer-mediated building processes). These constructions are assembled from a media-collection exhibiting fields of specific ambiguity or oscillating meaning. These elements also exhibit compressed potential meaning, lending meaning force to environmental encounters with emergent meaning.

1 See the subsequent chapter on *Specific Ambiguity*.

2 See Saussure's quote above related to chess (Saussure, 1959, p.88) in the chapter entitled "Games and Play."

3 Seaman's earlier work *The Exquisite Mechanism of Shivers*, as well as most of his earlier writings, are loaded with puns.

4 See Derrida in *Writing and Difference* ["*Différance*"] (Derrida, 1976, p.23) as well as Deleuze and Guattari in *A Thousand Plateaus* (Deleuze and Guattari, 1987) concerning the trace.

5 See the "Art Coefficient" as discussed by Marcel Duchamp in his text "The Creative Act" (Duchamp, 1989, p.139) "The 'Art Coefficient' is like an arithmetical relation between the unexpressed but intended and the unintentionally expressed."

6 Sound Puns: A "sound pun" is another example of a pun on punning. A sound can have a particular identity, signifying a sonic event, i.e., a spoken word, the noise of a car, the sound of jet, the song of an owl. If this event is ambiguous, an oscillation between varying spokes of potential meaning is brought about. A sound/noise may be either referential, i.e., the sound of a gun; indeterminate, what source is that sound coming from?; or an ambiguous mix of the two. An example of the sound pun follows. I made a video installation entitled "The Design Of The Grip." (Seaman, 1989) A series of sound recordings of *grip* oriented activities were made: the sound of a pistol, a crossbow firing, a bike brake, a pump etc. An audio track of music was composed using digital samples made from these sounds. The sounds functioned in a rhythmic, repetitious nature in the soundtrack. On nine different video tapes, visual images related to the sounds were edited to this very specific soundtrack. Each image was placed against a different, incorrect sound. In film language this is called "Foley." A "Foley Pit," is a place for recording *artificial* sound to be used in film and is named after the originating sound engineer. In *The Design Of The Grip*, these *real* sounds were displaced in time and functioned as artificial sounds for other *grip* oriented activities, in nearby contexts. A sonic ambiguity was formed through the juxtaposition of a particular image and an artificial, non-sync sound, edited to fall with it. It is interesting to note that the term "sound pun" contains a pun on "sound" - meaning both sonic and 'strong or good,' i.e. that was a sound [good] pun you just made... Like recombinant poetics, sound puns function on two levels; they describe a particular poetic potential, as well as become a self-reflexive example of that same potential.

7 Attridge refers to this punning as to "quiver with signification." It is significant, here, to mention the title of an earlier work of mine from 1991, *The Exquisite Mechanism of Shivers*. It is interesting to note one definition related to the etymology of the term shivers is "fragment." To again present a reference from above: "He would pun three into shivers with his fists." In *The Exquisite Mechanism of Shivers*, the viewer could frictionlessly substitute language modules in a grammatical template and subsequently enabled a process examining context, decontextualisation and recontextualisation, to explore states of meaning.

1.3.3.1 Punning Symbolic Logic — The Pun Which Puns on Punning

The techno-poetic mechanism embodies a system which propagates the inter-authorship of the programmer and artist, through symbolic logic. The result of this endeavour is finally manifested on the outermost level of the system of representation, as recombinant configurations of light and sound, although it is made operative through the mathematical/linguistic mechanism of computer programming functioning within a hardware environment.¹ Modular sonic, visual and textual elements, created by the artist, which are operative within this technological system, have a punning function in relation to that system; outwardly they communicate to the *vuser* artistic content through particular media-elements, while inwardly they perform as the functional connection to encoded symbolic logic - computer code. Not only does a word function as a pun to the viewer as content, but also this pun functions in another direction, acting as one representation presented on the outermost layer of symbolic logic, thus enabling the inter-operational characteristics of interactive computing — the positing of virtual space. This relation creates a form of dimensional/conceptual pun, bridging the linguistic nature of computer programming with the expanded linguistic content made operative through that programming.

It is the virtual nature of techno-poetic mechanism which enables effortless substitution of media-elements, producing spatial media-configurations of image, sound and text elements. We can even go so far as to say that the concept of the "Universal Machine," as developed by Turing, is one of the central principles enabling this effortless construction. Hodges, Turing's biographer, here describes certain aspects of the "universal machine:"

...underneath here lay the same powerful idea that Gödel had used, that there was no essential distinction between "numbers" and operations on numbers. From a modern mathematical point of view, they were all alike symbols. With this done, it followed that one particular machine could simulate the work done by *any* machine. He [Turing] called it the *universal* machine. It would be designed to read description numbers, decode them into tables and execute them. It could do what any other machine would have done, if it were provided with the description number of that machine on its tape. It would be a machine to do everything, which was enough to give anyone pause for thought. It was, furthermore, a machine of perfectly definite form. Alan worked out an exact table for the universal machine. (Hodges, 1983, p.104)

It is the varying symbolic properties² of computer code functioning as a pun on symbolic logic, both operative as symbolic logic while simultaneously operating on media elements and exploring media-processes (built through this symbolic logic), that enables the techno-poetic mechanism to function. I will speak at length about conceptual

machines in the chapter entitled "Bridging the Artistic, Philosophical and Literary with the Technological: Conceptual Machines."

1 See Smith and Keep, 1988, "Computer Software As Text: Developments In The Evaluation of Computer-Based Educational Media and Materials."

2 Lovelace provides this observation about qualities of symbolic operation: "They will also be aware that one reason why the separate nature of the science of operations has been little felt and in general little dwelt on, is the shifting meaning of many of the symbols used in mathematical notation." (Babbage, 1961, p.248). It might be said that I am punning on this feature.

1.3.4 Specific Ambiguity

Central to an exploration of emergent meaning is experiential engagement with differing forms of ambiguity. The unfixity characteristic of virtual computer-based contexts can be experientially witnessed in the techno-poetic mechanism. There is an intentional interest in poetic ambiguity within my combinatorial environment, where the context is always in a state of flux. Multiple factors can contribute to this ongoing condition. In the techno-poetic mechanism, this mutability is heightened by employing chosen poetic elements that exhibit a *specific ambiguity*. Historically, we can point to Saussure as initiating the discussion related to the arbitrariness of the linguistic sign as described in the *Course of General Linguistics*. In the techno-poetic mechanism, in textual instances, the "sign is arbitrary." (Saussure, 1983, p.67) The signifier may stay the same, but the signified will potentially shift in relation to particular alternate contexts. In terms of change over time, Saussure states "whatever the factors involved in [the] change, whether they act in isolation or in combination, they always result in a shift in the relationship between the signal and the signification." (Saussure, 1983, p.75) This relation can be abstracted in terms of other media-elements, although I am not seeking a logocentric model in terms of the multiple conveyances potentially witnessed within my generative virtual environment. This "shift" is enhanced and becomes activated by employing poetic media-elements that exhibit specific ambiguity, each conveying relative to contexts comprised of media-elements from similar and differing milieus. Thus, I am not only exploring the qualities of textual shift as referred to by Saussure, but also the potential pluralistic evocations of other media-elements.

Ambiguity is brought about in multiple ways. The techno-poetic mechanism is loaded with ambiguous media-elements as a potential starting point. When I speak of specific ambiguity, I am suggesting that the loading of the techno-poetic mechanism with these particular elements is quite intentional, notwithstanding at times poetically intuitive. This choice of media-elements is intentional, first by the author of the mechanism and, second, by the *vuser* of the mechanism who functions in a role of inter-authorship,

defining a momentary context or configuration of media-elements. In talking about the employment of ambiguity in poetry, Empson provides the following:

...You must rely on each particular poem to show you the way in which it is trying to be good; if it fails you cannot know its object; and it would be trivial to explain why it had failed at something it was not trying to achieve. (Empson, 1966, p.7)

It is important to remember that there are many enfolded intentions within my artistic work. As an example of recombinant poetics, many of the rules found in traditional poetry have been suspended. I earlier discussed the concept of *fields of meaning* as being relevant to this study. A field of meaning can be a media example chosen for its polyvalent specific ambiguity. As media-elements that are characterised by specific ambiguity are brought in juxtaposition and interpenetration, alternate evocations may be ascertained. As an author of this environment, I seek to present a situation where subsequent exploration and reflection forms a resonance of emergent meanings.

A technological context of "constructed" relations is brought about through the interaction of a *vuser* with the mechanism. Their activity brings about the potential for alternate interpretations of media-elements, as well as enabling highly ambiguous contexts to arise. Ambiguity can also potentially be emergent during the navigation of the work in that different "clusters" or configurations of elements can be viewed from alternate virtual viewing angles. Behaviours attributed to media-elements may also bring about ambiguity in that an element may follow a *behavioural* trajectory and suddenly become part of the flow of the environment. As stated above, the interpenetration of media-elements may also contribute to the ambiguity of the environment. William Empson outlines the following from his book, *7 Types of Ambiguity*:

1. The sorts of meaning to be considered; the Problems of Pure Sound and of Atmosphere.
2. In second-type ambiguities two or more alternate meanings are fully resolved into one.
3. The condition for third-type ambiguity is that two apparently unconnected meanings are given simultaneously.
4. In fourth type the alternative meanings combine to make clear a complicated state of mind in the author.
5. The fifth type is a fortunate confusion, as when the author is discovering his idea in the act of writing.

6. In the sixth type what is said is contradictory or irrelevant and the reader is forced to invent interpretations.
7. The seventh type is that of full contradiction, marking a division in the author's mind. (Empson, 1966, Contents page)

In the art work *The World Generator/The Engine of Desire*, all of these different examples can potentially arise in relation to *vuser* engagement, although it is very important to understand that we are dealing with a qualitatively different notion of context to that of Empson. Some additional examples of ambiguity may also arise during use of the mechanism. Here we are dealing with ambiguity within a generative computer-based virtual environment. Because there is an aspect of inter-authorship inherent to the techno-poetic mechanism, ambiguity can arise through the actions of the *vuser* that were not originally considered in the authoring of the work. Thus there is also an ambiguity to "authorship."

Ambiguity may be a product of a translation version - where text is presented in a language that is unknown to the *vuser* (a fully functional Japanese translation version of the work has been undertaken). Spatial ambiguity is also inherent to virtual contexts. Ambiguity brought about through interpenetration of media-elements can also be witnessed. Multiple-elements may be layered into the same 3D space, making a kind of hybrid form or media-molecule, that bears little resemblance to the initial forms used to generate it. We may choose to layer many texts spatially in one location. Positioning of this kind brings about an audio rendition of this layering — forming speech clusters that exhibit only a felt or associational meaning.

Another important factor is the extreme mutability of my environment. The *vuser* can actually choose to "empty" out the environment and select a new set of media-elements or edit a particular media-element to their satisfaction (within the limits of the system). Also the *vuser* has control over navigation within the environment. If they are in a section that they do not like they can "virtually move away" from it. There is an element of "focus" that the *vuser* brings to the work during navigation. If, for example, the audio that arises seems discordant, the user of the system can go about changing it or moving to a location which is out of earshot to that particular sonic element.

In *The World Generator/The Engine of Desire*, the pictorial and sonic environment that is generated, functions in conjunction with the interpretation of textual elements. The environment is brought about through human action on two levels, authorship and inter-authorship. It is the very nature of "plurivocality" that is made palpable in this mutable landscape of engagement. A media-element moves from the specific ambiguity,

as encountered in the menu system, to potentially highly ambiguous media-configurations, unknown by the initial author.

There is an additive process that presents additional meaning through this shift. This accumulative thought can be seen as taking that which the media-element initially conveyed plus that which a shift in context conveys. Thus, meaning becomes pluralistic. Even the removal of an initially conveyed configuration lends to an accretive emergent environmental meaning. We continuously encounter new contexts because the construction of context is highly unconstrained.

The techno-poetic mechanism enables the *vuser* of the system to start from an empty space, moving through time from this void to a constructed environment exhibiting a vast complexity of interrelations. The *vuser* of the system has an initial context to draw from — that of the spinning-wheel menu system. They then go about constructing a new context drawing on the myriad of choices that have been loaded in the system. There is a level of complexity inherent in the choices that are available for manipulation and observation. I am not attempting to make a copy of the real world. The environment functions as a poetic abstraction. I could say that this makes the "world" irrelevant to real-world language use. It is the author's contention that computer-based environments that are witnessed in the course of everyday life also exhibit similar or related forms of ambiguity. It is this ephemeral nature, exhibited and explored within the techno-poetic mechanism, that maps the very edges of evocation, that can best be addressed in an experiential environment. Instead of ignoring the "difficult" examples, I am intentionally exploring the nature of "complexity" inherent in emergent meaning production.

2.0 Backgrounds and Strategies

2.1 A Survey of Relevant Literary, Philosophical and Artistic Approaches

I have undertaken a survey of literary, philosophical and artistic strategies that are relevant to the production and exploration of emergent meaning. I have sought to define a series of applicable foci that could be drawn upon to inform the construction of a specific generative virtual environment. This section of the dissertation does not seek to provide a comprehensive historical survey of all approaches to emergent meaning. The magnitude of a survey of that kind falls outside of the scope of this project. I have sought, in particular, to inform the construction of a singular work of art.

2.1.1 The Conceptual Machine

Central to the construction of the techno-poetic mechanism is the concept of the *conceptual machine*. A *conceptual machine* can be defined as a machine that functions through text and in some cases through images or sounds. This conceptual machine seeks to be an active agent functioning within a generative process. Computer code, in the techno-poetic mechanism, functions as a specifically authored, operational, conceptual machine. I will begin my survey by examining the relevance of the conceptual machine. In what follows I will present a series of different conceptual machines and explore their relevance to my project. The most important function of the conceptual machine, to my project, is that it enables focused, generative media-construction. Poetic construction of this sort is essential to examining emergent meaning.

To best explore aspects of a mutable context, we must define an environment that can be easily altered. We seek to present different combinations of media-elements to observe how their juxtaposition and interpenetration can impact on particular meanings or an emergent outcome, as brought about through the interaction of a participant. In philosophy, there is a long history to combinatorial exploration.¹ The practice of Raymond Lull, as described by Martin Gardner, presents an analogue combinatorial mechanism:

Essentially, Lull's method was as follows. In every branch of knowledge, he believed, there are a small number of basic principles or categories that must be assumed without question. By exhausting all possible combinations of these categories, we are able to explore all knowledge that can be understood by our

finite minds. To construct tables of possible combinations we call upon the aid of both diagrams and rotating circles. For example we can list two sets of categories in two vertical columns, then exhaust all combinations simply by drawing connecting lines... A third method and the one in which Lull took the greatest pride, is to place two or more sets of terms on concentric circles. By rotating the inner circle we easily obtain a table of combinations. (Gardner, 1968, p.9)

Lull is relevant because his system propagates the relative positioning, repositioning and interrelation of chosen and/or authored elements. An importance is also placed on the nature of the "categories" of media-elements to be loaded into a system and explored through recombination. Unlike Lull, I do not believe that there are "a small number of basic principles" that "must be assumed without question." If one seeks to define a "number of basic principles" related to exploring meaning as subject, what would these principles be? The choice or authoring of particular media-elements becomes central in terms of defining a set of relevant variables. Because meaning is in part a product of the mind-set of the perceiver, it is impossible to ultimately define a central set of "basic principles," because the vastness of language use precludes any such set. Also because language is not a closed system but is a continuously living, extending and shifting terrain, it does not lend itself to a closed set of "basic principles," suggests the impossibility of this task.

I have defined a techno-poetic frame, seeking an inclusiveness of principles involved in the production and examination of emergent meaning. I acknowledge my artistic bias and the incompleteness of the approach. It is in part through this survey that I have sought to inform the choice of potentially relevant media-elements, behaviours and processes. I have also sought to inform the guiding principles of the enabling technological mechanism. Gardner articulates the importance of carefully loading a related combinatory system:

He [Lull] certainly did not think that the mere juxtaposition of terms provided in themselves a proof by "necessary reasons." He did think, however, that by mechanical combination of terms one could discover the necessary building blocks out of which valid arguments could then be constructed. (Gardner, 1968, p.17)

In a similar manner, I have generated a mechanism that brings about the suggestive juxtaposition and interpenetration of media-elements, enabling us to entertain specific thoughts and/or discourse about the nature of emergent meaning. When we examine this virtual environment, we must recognise that it is a diagrammatic space, designed to be consensual. The fact that it is a location, even if it is a virtual one, is historically relevant to notions of space discussed by Frances Yates in the *Art of Memory* (Yates,

1966). Yates, in speaking about Lull's system comments about the importance of the diagram as a place of contemplation and memory examination:

The memorative side, the memorising of the principles and procedures of the Art, was strongly insisted on by Lull and he seems to have thought of the diagrams of the art as in some sense places. (Yates, 1966, p.185)

I have made the techno-poetic mechanism an active or operable *diagram* of a *mutable* and emergent virtual "place." Central to approaching an environmental understanding of emergent meaning is the ability to construct a "place" or environment where the observation of varying configurations of media-elements as well as their relative interrelation can be entertained. The memory of interaction within this observation space also becomes relevant in terms of understanding the inter-conveyance of media-elements within a mutable time-based environment. We are observing a new form of spatial composition that takes on meaning in dynamic relation to textual, imagistic and sonic elements. My virtual environment can be seen as an extended example of the "topographic" writing space that Bolter describes. (Bolter, 1991, p.25) Joyce also speaks about the notion of place in hypertext, in particular presenting a chapter on the "Geography of the Word." (Joyce, 1995, p.159) In *Semiotics of Visual Language*, Saint-Martin articulates aspects of neighbouring within a topological environment:

The fundamental relationships of neighbouring or separation are not assigned to visual regions because of the consideration of a single characteristic among visual variables, since none as such can determine the level of energy intensity of a region. They are the result of a perceptual estimate and a synthesis integrating all visual variables in a region, along with their interaction with the ambient field. Both notions are the source of the emergence of the topological notion of limits, boundaries or frontiers, where the nature of the connections or passages between separate regions can be recognized. (Saint-Martin, 1990, p.69)

The functionality of the techno-poetic mechanism surpasses the simple turning of wheels to facilitate juxtapositions. I have sought to make the menu system of the techno-poetic mechanism facilitate juxtaposition through the spinning of various "virtual" container-wheels as well as through the selection of particular media-elements to be placed in the virtual environment, thus exploring the "connections or passages between separate regions" in relation to the "ambient field" of various media-elements. I have sought to engineer the techno-poetic mechanism so that it generates a highly complex, spatial, emergent, digital milieu. Gardner discusses the value of the Lullian technique in terms of the combinatorial relevance of certain specific elements:

In science there also are rare occasions when a Lullian technique might prove useful...The periodic table can be considered a kind of Lullian chart that exhausts all permissible combinations of certain principles and by means of

which chemists have been able to predict the properties of elements before they were discovered. Lull's crude anticipation was a circle bearing the four traditional elements and rotated within a ring similarly labelled. (Gardner, 1968, pp.19-20)

The loading of the techno-poetic mechanism with particular fields of content focuses the range of potential experiences that we might encounter.² We can also see the potential of generating a virtual form of "memory theatre" by defining a specific relational environment of media-elements and maintaining it as a fixed, non-mutable space. In terms of memory, my environment could function as a mnemonic device because we could move through the memory of a fixed virtual space and trigger the memory of specific subject matter associated with symbolic elements housed in that space. An extended exposition on memory as it relates to the potentials of the techno-poetic mechanism falls outside of the range of this paper. I will, however, present two further examples that are specifically relevant to my project.

Significant to the discussion of viewer association presented in *The Art of Memory* by Yates is Guilio Camillo's *Theatro Del Mundo* or *Theatre of Memory*. We can observe such a device as another analogue conceptual machine. In the early 1600's, Guilio Camillo's "memory theatre" explored associational connections between symbolic images and memory. Yates cites Camillo in articulating the relation between space and memory:

The theatre is a system of memory places, through a "high and incomparable" placing; it performs the office of a classical memory system for orators by "conserving for us the things, words and arts which we confide to it." (Yates, 1966, p.144)

The ability to selectively store, place and move media-elements within a virtual environment is the key to the construction of a mutable context designed to explore the nature of emergent meaning. The loading of the techno-poetic mechanism with particular media-elements is a contemporary example of such "confiding." Ideas explored conceptually by Camillo in the early 1600's directly relate to notions central to the potential structuring of poetic elements in the techno-poetic mechanism: they propose a means of housing, a structuring paradigm and an access mechanism for exploring human memory and association which, here, can be understood in the light of contemporary computer-based interaction. The physical structure of the memory theatre enabled both non-linear access, another key notion relevant to the construction of my device and the potential to combine and recombine information based on the interaction of the participant. The following is a description which discusses the nature of

interaction within a particular memory theatre, from the book *Theatregarden Beastarium* as expressed by Chris Dercon:

A spectator would sit at a central location inside a portable wooden structure which contained seven groupings of information, each accessible from seven different levels. The viewer would engage with an environment designed to reveal secrets about the structure of the universe, from the realm of the microcosmic to that of the macrocosmic. On the walls of the *Theatro Del Mundo* were inscribed all of the signs and symbols of the Christian Renaissance: the stars, the planets, the Greek gods and their attributes, animals and plants, the elements and their alchemical symbols, the temperaments, the vices and virtues. The theatre also contained wooden drawers filled with written texts that combined all of these elements within a "universal book." Viewers made choices from a central location, which enabled them to explore information housed in containers in close proximity to the participant. The room was organised in tiers which grouped information that dealt with questions of the universe, expanding upon innumerable aspects of creation. (Dercon, 1990)

Relevant to my exploration of emergent meaning is the notion of a constructed space enfolding different functionalities including the following: the potential to group particular media-elements and/or processes within a virtual space, the potential to change the scale of a media-elements, the potential to house images within the mechanism, the potential to store texts; the portability of the mechanism, and the potential to easily access these media-elements and processes from a central location. It is particularly relevant that we could act upon those elements in relation to other chosen elements, within a singular, operative environment.

A third practitioner exploring combinatorial memory mechanisms is Giordano Bruno. Bruno employed the use of rotating wheels to enable alternate juxtapositions of chosen elements. This analogue mechanism can be seen as relevant to my "virtual" discourse environment. Yates observes:

Bruno's brilliant achievement in finding a way of combining the classical art of memory with Lullism thus rested on an extreme "occultising" of both the classical art and of Lullism. He put the images of the classical art on the Lullian combinatory wheels, but the images were magic images and the wheels were conjuring wheels. (Yates, 1966, p.211)

It is the notion of "conjuring" that I am interested in here. Instead of "conjuring" a so-called "magic" world of interrelation, I am seeking to enable the creation of an emergent virtual poetic world, rendered within a particular generative computer-based environment. Virtual space could be considered a form of computer-based "conjuring." The storage and subsequent virtual use of particular media-material enables the exploration of differing configurations of that material.

All of the above systems can be seen as conceptual machines, serving the exploration of processes related to memory, thought and meaning production.

1 We might consider the *I Ching* (Wilhelm [Edition], 1967) as one ancient starting point. A complete discussion of the *I Ching* and its relevance to my project falls outside of the range of this document. See also the later section on Cage where I speak about his use of the *I Ching* as a computer.

2 Although I have sought to construct the techno-poetic mechanism to explore emergent meaning, the operative nature of the mechanism has many potentials for other uses including alternate forms of discourse, object-based programming, media storage, design and virtual environment construction. I will discuss this in the chapter entitled *Future Research*.

2.1.2 Computer Code as Conceptual Machine

In informing the functionality of the techno-poetic device, we can look to a history of other conceptual machines. We can say that computer code is a conceptual machine that brings about certain processes when functioning in conjunction with appropriate hardware. In the construction of the techno-poetic mechanism, I have sought to enfold ideas about meaning and present them through experiential use within a unified, code-driven environment. This environment exemplifies, on a limited scale, the unity and interconnectedness of all things. This concept is profoundly spiritual, and is written about by Buddhists, Sufis, as well as other spiritual traditions. Yates quotes Bruno from his "Thirty concepts of ideas":

Everything that is, after the One is necessarily multiplex and numerous. Thus on the lowest grade of the scale of nature is infinite number, on the highest is infinite unity. (Yates, 1966, p.227)

Spiritual concerns are embodied within the techno-poetic mechanism, forming another realm of potential enquiry. An inquiry into these spiritual questions falls outside of the breadth of this document. In the introduction I spoke of the infinite complexity of the world and the limits of language to reflect upon this complexity. Here we must acknowledge how meaning arises within a highly complex, unified environment of interrelated media-elements and processes. This notion invokes Derrida, pointing toward his observation on the infinite "illimitable" nature of context. (Moorjani, date not set)¹

When we reflect on how meaning arises within contemporary non-linear electronic environments ranging from hypertextual spaces to virtual worlds housing media-elements exhibiting complex authored behaviours, we can see the necessity for the authoring of a unified operational environment, that enables varying juxtapositions of particular media. It is here important to trace the lineage leading to a philosophical space

of computing concerned with combinatorial practice. Here Leibniz is a key thinker bringing forward ideas stemming from both Lull and Bruno.

But it is in Leibniz who affords by far the most remarkable example of the survival of influences from the art of memory and from Lullism in the mind of a great seventeenth-century figure. It is generally known that Leibniz was interested in Lullism and wrote a work *De arte combinatoria* based on adaptations of Lullism. What is not so well known, though it has been pointed out by Paolli Rossi, is that Leibniz was also very familiar with the traditions of the classical art of memory. In fact Leibniz's efforts at inventing a universal calculus using combinations of significant signs or characters can undoubtedly be seen as descending historically from those historical efforts to combine Lullism with the art of memory of which Giordano Bruno was such an outstanding example. But the characters of Leibniz's 'characteristica' were mathematical symbols and their logical combinations were to produce the invention of the infinitesimal calculus. (Yates, 1966, p.380)

I am very much interested in this lineage from Lull to Bruno to Leibniz. We can trace how these combinatorial wheels and memory-related apparatuses lead through time to the beginnings of symbolic logic in Leibniz, which in turn eventuates into the computer programming of today. I am using *virtual* combinations to explore meaning production. Where Leibniz explored mathematical symbols within a combinatorial environment, I have sought to load my techno-poetic mechanism with particular aesthetic elements, that in operative form point at the nature of emergent meaning. As earlier stated, it is an underlying symbolic logic that enables this generative environment to become functional. Images and music/sound ride on the metaphorical surface of these calculations and are themselves products of *computation*. Martin Gardner speaks about the relevance of Leibniz in relation to combinatorial and computational strategies:

At the age of 19 he wrote his *Dissertio de Arte Combinatoria* (Leipzig, 1666), in which he discovers in Lull's work the germ of a universal algebra by which all knowledge, including moral and metaphysical truths, can someday be brought within a single deductive system. "If controversies were to arise," Leibniz later declared in an oft-quoted passage, "there would be no more need of disputation between two philosophers than between two accountants. For it would suffice to take their pencils in their hands, to sit down to their slates and to say to each other (with a friend to witness, if they liked): Let us Calculate."

These speculations of Leibniz's have led many historians to credit Lull with having foreshadowed the development of modern symbolic logic and the empiricist's dream of the "unity of science". (Gardner, 1982, p.3)

Where Leibniz was interested in creating a "deductive" calculus, I have sought to create an abductive instance-generator, utilising combinatorial means. I believe his goal of a "universal algebra" is not achievable. I do not believe that one can not bring "all knowledge, including moral and metaphysical truths, ...within a single deductive system."

I have created a device which exemplifies the relative nature of meanings that are produced through the time-based inter-conveyance of media-elements. Leibniz was in some ways skeptical and critical of Lull's "arts of divination," although he also found some positive examples as employed in the exploration of "useful particular problems" (Gardner, 1958, p.25). It is my exploration of a *punning* symbolic logic that I wish again to point at here, where outwardly, to the *vuser* I am presenting images, music, sound and texts, to be explored through combination and recombination within a computer-based virtual environment, while inwardly, these function as the outermost layer of symbolic logic in the computer. I continue to extend and enfold relations between many fields of enquiry. I have sought to present an operative discourse environment that enables the exploration of a conflation of the *language-vehicles* becoming operational through the underlying language of the computer code within a specifically authored conceptual/virtual machine.

The memory of this ongoing process of interaction is always relevant to the time-based field of emergent meaning. Umberto Eco here extends our understanding of the concept of *fields of meaning* (see earlier chapter) in relation to memory, while also pointing towards memory's importance to aesthetic practice:

In the field of aesthetic stimuli, signs are bound by a necessity that is rooted in the perceptual habits of the addressee (otherwise known as taste): rhyme, meter, a more or less conventional sense of proportion, the need for verisimilitude, other stylistic concerns. Form is perceived as a necessary, justified whole that cannot be broken. Unable to isolate referents, the addressee must then rely on his capacity to apprehend the complex signification which the entire expression imposes on him. The result is a multiform, plurivocal signified that leaves us at once satisfied and disappointed with the first phase of comprehension precisely because of its variety, its indefiniteness. Charged with a complex scheme of references mostly drawn from memories of previous experiences, we then refer back to the initial message, which will be inevitably enriched by the interaction between those memories and the signifieds yielded in the course of this second contact — signifieds that will already be different from those apprehended initially, given the new perspective and the new hierarchy of stimuli of this second approach.

Eco continues:

This transaction between the memory of previous experiences, the system of meanings that has surfaced during the first contact (and will again reappear as a "harmonic background" in the second approach) and the new system of meanings that is emerging out of a second contact automatically enriches the meaning of the original message — which far from being exhausted by the process, appears all the more fertile (in its own material constitution) and open to new readings as our understanding of it gets more and more complex. (Eco, 1989, p.37)

Meaning production is enhanced through extended recontextualisation and the exploration of emergent context within the techno-poetic mechanism. This process is enabled through the use of the conceptual machine of computer code, made operative in a computer-based environment. This "necessary, justified whole" describes a potential context engendered through an intermingling of fields — a constructed configuration of media-elements.

I have authored a generator mechanism as a functional part of the techno-poetic device. The production of the art work can be viewed in a meta-operative fashion. The *vuser* of the system entertains the functionality of the generator while exploring a range of processes inherent to the inter-authored production of the work. The *vuser* also observes the projected visual and sonic *output* from the generator — a virtual world produced through interaction with the device.

Morissette, in his text *Post-Modern Generative fiction: Novel and Film*, presents an initial analysis of generator types:

Our object here is to present a synchronic, contemporary analysis of generative theory and practice in post-modern literature and film. Although the novel and the film of fiction are our chief interests, some excursions are required into nonfictional areas, especially in literature. This becomes apparent if we start by dividing types of post-modern generators into two main classes, linguistic generators and situational generators. The latter almost inevitably produce fictional structures, while the former may be limited to poetry, or to texts of non-fiction prose. The most evolved generator works will contain both types. (Morissette, 1975, p.254)

I have sought to explore environmental meaning by enfolding both a "linguistic" generator and a "situational" generator. Extending Morissette's vision, I have authored a generator of complex poetic virtual worlds. We must remember that virtual space is a fictional/symbolic space — an illusion — nevertheless it may be directly linked to non-fictional, physical elements or processes. This linkage, between virtual world and physical interface, is central to human/machine interface design. The techno-poetic mechanism enables both the perusal of identifiable objects and text as well as their ultimate abstraction and hybridisation, through interpenetration, as brought about through interaction originating from a physical interface.

Bailey discusses Swift in relation to poetry generating machines in general:

Nearly everyone who writes about computer-assisted poetry begins by tracing the idea back to Jonathan Swift's description of the Grand Academy of Lagado in *Gulliver's Travels*, first published in 1726. The writing machine developed by the Lagadonians was mechanical rather than electronic, but its output would

certainly resemble most efforts so far to produce poetry by computer. (Bailey, 1974, p.293)

In terms of notions related to a "linguistic generator," the work of Jonathan Swift presents a very early description of one device, albeit in the form of a parody. This description becomes a *conceptual machine* authored by Swift and presented in *Gulliver's Travels*. In this case the generating mechanism is a description of a *physicall/conceptual machine* that is made manifest through narrative language-fiction. In *Logic Diagrams and Boolean Algebra*, Gardner suggests that Swift was intentionally pointing toward Lull:

Swift is thought to have Lull's art in mind when he described a machine invented by a professor of Laputa (*Gulliver's Travels* Part III, Chapter 5). This contrivance was a 20 foot square frame containing hundreds of small cubes linked together by wires. On the face of each cube was written a Laputan word. By turning a crank, the cubes were rotated to produce random combinations of faces. Whenever a few words happened to come together and make sense, they were copied down; then from these broken phrases erudite treatises were composed. In this manner Swift explained, "The most ignorant person at a reasonable charge and with a little bodily labour, may write books in philosophy, poetry, politics, law, mathematics and theology, without the least assistance from genius or study." (Gardner, 1968, p.2)

While Swift suggests through parody that a system could be used to author "erudite" books through "rotation," the potential of the techno-poetic mechanism created for my project quite seriously seeks to enable the generation of complex, aesthetic digital worlds, through a related virtual-combinatorial device. Unlike Swift, generated worlds could be tied to *intelligent* databases through enhanced (pointed) functionality and could enable constructions dealing with "philosophy, poetry, politics, law, mathematics and theology." The *World Generator/The Engine of Desire* seeks to be a tool enabling the intelligent construction of specific environments for the observation of emergent meaning. In particular, the notion of re-embodied intelligence² can be applied through particular menu options. Thus a participant may be of limited intelligence and still produce examples of advanced virtual spaces, by engaging processes of re-embodied intelligence during inter-authorship.

The "Lagodian's" conceptual/physical writing machine (brought to life within the story) is relevant to my project. Certain of my past art works³ have systematically explored generative processes. Generative systems enable the participant to facilitate poetic construction by selecting from a series of pre-determined modular linguistic elements that in turn are linked to media-elements of audio and Laserdisc video. This videodisc is mediated by the computer control. Interactivity, in those works, is articulated both through individual selection of linguistic variables as well as through chance methods.

It was, in fact, the preceding notion that suggested the potential of authoring the techno-poetic mechanism: if one could create a sentence from variables using the computer as a generative organising system, it followed that one could potentially create a set of linked language-based algorithms that could in turn construct a generative virtual environment; again driven by an underlying set of logical symbolic operations. This concept, conflating computer code and media-element, is the same principle that Turing (Hodges, 1983, p.104) articulated in terms of his notion of the Universal Machine⁴. It is again important to note that both the mechanism which operates on the media and the media itself, are potentially housed within the same device. This can be related back to a concept initiated by Gödel — there is "no essential distinction between 'numbers' and operations on numbers." (Hodges, 1983, p.104)

The techno-poetic mechanism enables the exploration of a mixed-semiotic spatial environment. Derrida asks, "But is it by chance that the book is, first and foremost, volume?" (Derrida, 1978, p.25) The upshot is as follows: computer code can function as a conceptual machine to enable the exploration of language-vehicles in a complex, inter-operative, generative virtual "volume" exploring emergent meaning.

1 See also (Derrida, 1988, p.79)

2 See the chapter of this dissertation entitled "Re-Embodied Intelligence: An Approach to the Translation of High-level Artistic Processes into a Computer-Based Operative Environment."

3 See the Appendix, Figure 1.

4 See the chapter entitled: "Punning Symbolic Logic - The Pun Which Puns on Punning."

2.1.3 A Specific Example of the Conceptual Machine: The Formula or Recipe as Generative Device

Other conceptual machines have been employed as generative literary devices. The example of the "formula" or "recipe" is evident in different artists' approaches. Lewis Carroll, Leconte de Lisle and Tristan Tzara wrote related textual formulas. In the following excerpt from *Dada Manifeste sur L'Amour Faible et L'Amour Amer*, (*Dada Manifesto on Weak Love and Bitter Love*) is a translation from the French of Tzara's formula:

To Write a Dada Poem: Take a newspaper. Take some scissors. Pick out an article which is as long as you wish your poem to be. Cut out the article. Then cut out carefully each of the words in the article and put them in a bag. Shake gently. Then take out each piece one after the other. Copy them down conscientiously in the order in which they left the bag. The poem will resemble you and you will find yourself to be an infinitely original writer with a charming sensitivity even though you will not be understood by the vulgar. (Peterson, 1971, p.35)

Peterson, in his research on Tzara, writes the following: "Professor Alfred G. Engstrom of the University of North Carolina has found two or three quite similar recipes for poetry, one of them (astonishingly enough) by Leconte de Lisle, who obviously was opposed to this way of composing verse."¹ (Peterson, 1971) The following is a translation of Leconte de Lisle's recipe:

Look, take a hat and put in it some adverbs, conjunctions, prepositions, nouns, adjectives, pull out at random and write. You will have some symbolism, decadentism, instrumentism and all the nonsense that comes from these. You laugh? But I assure you that it's serious; what they do is nothing else. They are the lovers of delirium whom Baudelaire speaks about. (Peterson, 1971, pp.35-36)

It is significant that these recipes can be ironic, serious, playful, humorous and/or nonsensical. A computer-based literary "conceptual machine" may be authored by abstracting or modelling any historical literary approach and translating that approach into a computer-based, operational environment.

Utilising a cut-up method, as here described, the author of the poem constructs a singular example which has been derived from the particular formulaic system. A set of selections is subsequently fixed in a particular configuration as derived through chance procedures. The techno-poetic mechanism enables us to computer-mediate the combinatorial process, enabling this procedure to be driven first-hand by the *user* or

through a continuous process which might be initiated and continued indefinitely as driven by the computer itself.

The system that characterises the techno-poetic mechanism has been modelled and abstracted from a related "recipe," and embodied within the computing environment. In the language of computing we could call this kind of a "recipe" an algorithm. Unlike the fixity of the above texts, the viewer can potentially explore a process which is continuous, fleeting and unfixed. In my techno-poetic environment there is no closure, although a fixed set of media-elements are loaded into the system.

Another writer exploring the cut-up, recipe method was Lewis Carroll. In the poem *Poeta Fit, non Nascitur* Carroll lays out the following suggestion:

First learn to be spasmodic
A very simple rule.
For first you write a sentence,
And then you chop it small;
Then mix the bits and sort them out
Just as they chance to fall;
The order of the phrases makes
No difference at all.

Then if you'd be impressive,
Remember what I say,
The abstract qualities begin
With capitals always:
The True, the Good, the Beautiful — Those are the things that pay.
(Carroll, 1936, pp.880-881)

When Carroll articulates the employment of the "The True, the Good, the Beautiful," he is potentially wryly speaking about a metaphorical loading of the dice, thus heightening the probability of a particular quality of outcome utilising the chance procedures described in the above stanzas. Carroll may have been attempting to point toward an intentional displacement of language surrounding these problematic universalising concepts, by approaching them through the cut-up method.

In the pursuit of designing a techno-poetic mechanism exploring emergent meaning, I have specifically sought to "load the dice" by carefully authoring and selecting the media-elements which potentially populate the generated electronic environment. It is significant that these media-elements can be placed in any order that the *vuser* of the system organises through their personal volition, as brought about through interaction with the elaborate set of computer-based "recipes" or algorithms that are made operative in the exploration of emergent meaning.

¹ See *Modern Language Notes* 73 (June 1958):434-436.

2.1.4 René Magritte

Magritte is important to the work because of his playful and enigmatic juxtaposition of words and images. In *Magritte: This is not a Pipe* by Foucault, Magritte is quoted as saying: "Between words and objects one can create new relations and specify characteristics of language and objects generally ignored in everyday life." (Foucault, 1983, p.38) Foucault articulates this intrusion that knits together two different milieus:

A little like the anonymous hand that designated the pipe by his statement "This is not a pipe," Magritte names his paintings in order to focus attention upon the very act of naming. And yet, in this split and drifting space, strange bonds are knit, there occur intrusions, brusque and destructive invasions, avalanches of images into the milieu of words and verbal lightening flashes that streak and shatter the drawings." (Foucault, 1983, p.36)

The operative nature of these "strange bonds" is what I seek to point toward through the functionality of the techno-poetic mechanism. Contrary to Foucault, I do not see these as "brusque and destructive invasions" but as an attempt to locate a particular realm of conveyance that is common to contemporary language use. It is a mixed semiotic exploration, attempting to examine the intermingling of milieus, that drives my project. This intermingling explores multiple forms of evocative meaning conveyance.

2.1.5 William Burroughs and Brion Gysin

Another set of authors who explore the transgressive literary strategy of the cut-up include William Burroughs and Brion Gysin, who began their work with the form in the late 1950s. In particular the exploration of the cut-up technique is relevant to further investigations into mechanisms that are potentially generative of emergent meaning:

What struck both Gysin and Burroughs about the cut-up method was the possibility of using this technique to make the writer's medium tangible — to make the word an object detached from its context, its author, its signifying function.

The method itself is simple: "Cut right through the pages of any book or newsprint...lengthwise, for example and shuffle the columns of text. Put them together at hazard and read the newly constituted message. Do it for yourself." (Lydenberg, 1987, p.44)

Burroughs acknowledged his debt to both Gysin and Tristan Tzara, whom I earlier acknowledged. Again, this technique functions as a form of algorithm or "conceptual machine" to explore displacement and the nature of linguistic context. Kahn, in

Wireless Imagination, points toward the genetic metaphor in Burroughs work, in relation to the generation of context:

The cut-ups were derived from reworked Dada collage techniques, but Burroughs' ideas surrounding them, set forth in his novels, essays and audiotapes, elaborated a new system of recorded sound that metaphorically extended the idea of recording from a psychobiological recording at the level of the genetic code — formed the cipher of the four DNA bases — on out to the realms of political conspiracy and spiritist forces. This writing could tie together the proliferating genetic material of viruses, the syntax of language and the contagion of ideologies, the segmentations of bodies and systems. (Kahn and Whitehead, 1992, p.13)

One can see the central relevance of the further extension of the recombinant metaphor into the realm of media-elements as articulated within *The World Generator/The Engine of Desire*. Emergent meanings are unleashed through processes of recontextualisation. Burroughs was quite interested in the fact, like Barthes, that language, as Lydenberg points out, "speaks within a network of infinite anonymous citations:" (Lydenberg, 1987, p.45)

Every writer is perceived as drawing from the language system, selecting and rearranging that material, either intersecting with and appropriating arrangements already made, or scrupulously avoiding or distorting those preexisting patterns. In either case the writer proceeds according to a certain relationship to the body of language and literary tradition. For Burroughs, the cut-up is merely a device for making this relationship explicit. (Lydenberg, 1987, p.46)

It is the techno-poetic mechanism which seeks to make the selection and rearrangement of media-elements an integral process in the perception of a work. This engaging process enables the observation of particular meanings as they arise through interaction with the system. In *Structuralist Poetics*, Culler outlines the importance of a particular form of structuralist poetics as defined by Barthes:

The task of structuralist poetics, as Barthes defines it, would be to make explicit the underlying system which makes literary effects possible. It would not be a "science of contents" which, in hermeneutic fashion, proposed interpretations for works, "but a science of the condition of content, that is to say of forms. What interests... will be the variation of meaning generated and as it were, capable of being generated by works: it will not interpret symbols but describe their polyvalency. In short, its object will not be the full meaning of the work but the contrary and empty meaning which supports them all." (Culler, 1975, p.118)

In counter-distinction to Culler, emergent meaning can be seen as an accumulated mass of fields and perceptions — conveyances. There is never an empty meaning which supports them all, there is only context and relative interpretation over time. As these

interpretations co-mingle, a layered multiplicity is constructed. Because each *vuser* entertains a potentially different configuration of media-elements, no definitive interpretation can ever be defined. This again leads one to the notion of emergence and its ongoing re-definition.

2.1.6 The "Event Scores" of George Brecht

George Brecht, the Fluxus artist and scientist, has made a series of works called "Event Scores." (Hendricks, 1988) Brecht is relevant to my project because of his early research into chance procedures in terms of art practice (Brecht 1966)¹. The event scores are very simple, suggestive groups of words which function as conceptual scores for the creation of fluxus music/sound events. Again, the notion of the conceptual machine, in this case built of simple poetic language, can be used to inform the authorship of emergent works of art².

¹ See this pre-Cage writing on chance (Brecht 1966).

² See (Brecht 1975) in terms of paradox. See also *The Book of the Tumbler on Fire* by Henry Martin.

2.1.7 Conceptual Art: A Continuation of the Theme of the Conceptual Machine

Many artists have explored generative systems of art-making from the perspective of conceptual art. In terms of my interest in algorithmic creation and conceptual machines, two different artists are particularly relevant: Lawrence Weiner and Sol Lewitt. Weiner used the following statement as a meta-conceptual machine to articulate a series of relations surrounding conceptual machines:

1. The artist may construct the piece
2. The piece may be fabricated
3. The piece need not be built

Each being equal and consistent with the intent of the artist the decision as to condition rests with the receiver upon the occasion of receivership. (Battcock, 1973, p.175)¹

Central here, is the notion of fabrication. This can be read as a pun, where the art work, "piece," may be "fabricated" or built as well as the notion that a fabrication is a made-up narrative. A narrative can also function as a conceptual machine. Also central is the

notion that the viewer completes the work through their active conceptual engagement, as earlier discussed in terms of Duchamp. (Duchamp, 1989, p.140)

Sol Lewitt in a related statement suggests, "The idea becomes a machine that makes the art." (Battcock, 1973, p.74) Again we see the notion of a conceptual machine functioning to facilitate art production. One can also see an understanding related to the notion that the construction of meaning takes place in the mind of the participant/viewer. It is interesting to note that one of the early conceptual art exhibitions curated by Seth Siegelaub in the Jewish Museum in 1970, was entitled *Software*. (Meyer, 1972, p.xi) I am also interested, in terms of the techno-poetic mechanism, in the potential meta-functionality of art. We can see the seeds of this exploration of meta-functionality existing in the work of Marcel Duchamp, among others, who will be discussed at length, below. I have sought to create a mechanism that not only becomes operational, but meta-operational, enabling a dynamic inter-relation to be generated between the *vuser* and the environment of emergent meaning.

¹ See also the original context — Arts Magazine, April, 1970.

2.1.8 Jackson Mac Low

One creator who early on saw the value of the computer in relation to the algorithmic authoring of poetic texts is Jackson Mac Low (Hendricks, 1988). The field of computer poetry is extensive and has a rich history of its own. An in-depth examination of text-based computer poetry is outside of the scope of this research¹.

¹ I will examine a series of artists exploring new poetic forms in the chapter entitled "A Selection of Hybrid Technological, Literary and Artistic Works — Toward the Definition of a Field: Recombinant Poetics."

2.1.9 Conceptual Machines Drawn From Differing Branches of Poetics

We now have the concept of a conceptual/physical machine made operative in a computer-based environment and loaded with specific media-elements. How would one best author or choose these media-elements in terms of the task at hand - the examination of emergent meaning. As stated earlier, the media-elements employed in my system are diverse in nature, exploring different aesthetic realms. In continuing to seek to inform the construction of the techno-poetic mechanism, we can observe the enfolding of different branches of poetics, within a series of Futurist works. The

sonic/typographic images of F. T. Marinetti, or as he called them in his writings "synthesizing noise making poems," (Marinetti, 1972, pp.332-333) are relevant to the project and are exemplified in the work *Zang Tumb Tuuum* (1914). These works explore experimental use of text within a pictorial/poetic environment.

Malcolm Le Grice, in *Abstract Film and Beyond*, discusses the Futurists in terms of their cinematic exploration of a plethora of different media. This pluralistic concern with media is central to the construction of the techno-poetic mechanism. The enfolding of media-elements and processes within the virtual environment enables a complex mutable meaning-site to be entertained. Le Grice points toward the Futurist Manifesto, positing a range of media explored by the Futurists:

The final section of the manifesto is a list of fourteen positive directions which it sees as open to futurist Cinema, summing up as follows: "Painting + sculpture + plastic dynamism + words-in-freedom + compounded noises + architecture + synthetic theatre = Futurist Cinema." (Le Grice, 1977, p.12)

This description can be specifically related to the media-elements and processes that have been authored into the techno-poetic mechanism. Le Grice points out the following about abstract Futurist Cinema:

In the light of recent historical information, there is a curious factor about the list of possibilities which appear in the manifesto. Except as an inference which can be drawn from the general tone of the writing and from its most generalised statements, nowhere does it explicitly visualize a non-representational, abstract cinema. (Le Grice, 1977, p.12)

The World Generator /The Engine of Desire is generative through the exploration of representational elements and/or abstract media elements. As these elements interpenetrate, they form various abstractions and hybrid non-objective spatiotemporal media-configurations. At various times, non-representational configurations arise, contributing to an environmental exploration of emergent meaning through abstraction.

2.1.10 Conceptual/Physical Machines — Salient Literary and Artistic Processes

The chance positioning of both linguistic and non-linguistic materials becomes one potential organising mechanism. Hans Arp explored "cut" and "torn" material in terms of random spatialisation. Robert Motherwell, in the "Prefactory Note" in Arp's book *On My Way*, writes about Arp's practice:

Even the torn papers in his collages "arranged accordingly to the laws of chance" which might, to the innocent, seem an angry rebellion against traditional art are serene, an effort to find a natural order, like that of leaves fallen on the ground (an order like any other when perceived as such and relaxed and uninsistent). (Arp, 1948, p.6)

Central to the techno-poetic mechanism is the [semi-random (see description above)] chance positioning of elements. This use of chance, forms one potential set of structuring devices, enabling unforeseen juxtapositions of media-elements. Chance processes function as a mechanism to generate emergent relations.

The notion that an image may be torn or fragmented is also applicable to the variable forms that characterise media-elements. As these media-elements are interpenetrated, they intersect and overlap. Also, texture maps of pictures can be wrapped around the surface of spatial objects. These may also appear fragmented, where only sections of the image are visible.

2.1.11 Raymond Roussel

Raymond Roussel is central to a discussion of conceptual machines. *Impressions of Africa*, (Roussel, 1967) with its descriptions of mechanical-poetic devices employed elaborate generative strategies and was seminal to the work of Marcel Duchamp on more than one level, both in terms of machinic content and in terms of his own employment of generative methodologies. Morrisette, writing about generative methodologies, observed the emergent potentials of Roussel's texts, especially in terms of their ability to enable shifts in the meaning of particular words based on recontextualisation (Morrisette, 1975, p.256). This notion, of meaning arising out of contextual change, has previously been discussed at length above. Thus, Roussel's elaborate textual strategies functioned as "conceptual machines" in terms of the generation of his writings as well as through the descriptions of generative machines in his writings.

2.1.12 Marcel Duchamp

Marcel Duchamp's oeuvre is applicable in multiple ways to the construction of a techno-poetic mechanism exploring emergent meaning. One particularly relevant interactive analogue technology was Duchamp's *La Boîte En Valise* (1941). Duchamp created an interactive art work that enabled spectators to view miniature reproductions

of his major works through a simple yet ingenious sliding housing-mechanism nestled in a leather suitcase along with miniature sculptural replicas of chosen works. We can also see concepts related to the notion of the *conceptual machine* proliferating in another form, through the simultaneous and interrelated workings of a physical interactive viewing mechanism. This analogue device housed reproductions of a symbolic nature. One salient characteristic of the techno-poetic mechanism relates to the exploration and/or navigation of reproductions — where the reproduction becomes the original material of operative experience. The mobility and operative nature of Duchamp's box again enables juxtapositions and recontextualisations of material, potentially exploring emergent meaning.

Duchamp also produced a related work, *The Green Box* (1934)¹ which presented a series of texts and diagrams that poetically qualify the interpretation of some works included in *La Boîte En Valise*, in particular these notes referred to symbolic elements in Duchamp's *The Bride Stripped Bare By Her Bachelors, Even* (1915-1923) (*La Mariee Mise a Nue Par ses Celibataires, Meme*), also known as *The Large Glass*. Through the navigation of these notes and the associated meanings which they trigger in relation to *The Large Glass*, we can project the poetic potential of computer-based interactive viewing structures. Duchamp described his intentions:

I thought I could collect, in an album like the Saint-Etienne catalogue, some calculations, some reflections, without relating them... I wanted the album to go with the "Glass," and to be consulted when seeing the "Glass" because, as I see it, it must not be "looked at" in the aesthetic sense of the word. One must consult the book and see the two together. (Cabanne, 1971, pp.42-43)

We see an abstracted, analogous precursor to the hardware/software paradigm in terms of the relation between *The Large Glass* and the associated notes. The idea of the *conceptual machine* is again at play, functioning through a set of relations brought about by the juxtaposition of the abstract poetic language presented within *The Green Box* notes. These written observations becomes operative as a conceptual filter, qualifying the open, symbolic, images of *The Large Glass*. The significance of these inter-conveying works to concerns related to emergent meaning are manifold. The notes are often not tied to specific symbolic images in *The Large Glass* but can be read in relation to different aspects of the image field. Alternate juxtapositions or recombinations are entertained by the observer as part of a conceptual animating process. Through these conceptual juxtapositions, a process of emergent meaning production is facilitated. Although *The Large Glass* is a static work, the textual notes conceptually animate it through linguistic/pictorial interrelation. The viewer/participant

becomes highly engaged in the pluralistic reading of Duchamp's work through subsequent juxtapositions and related association. The non-hierarchical nature of the relations exhibited between the notes and *The Large Glass*, provide the potential for alternate readings based on spatiotemporal relations.

The two works function in tandem as a springboard for non-linear juxtaposition activating the association of the participant. The enigmatic nature that Duchamp's works bring to light, continues, over time, to prove fascinating. These particular works, like my techno-poetic mechanism, are predicated on non-closure. *The Green Box* notes qualify the meanings of symbols and images in *The Large Glass* and present fields of potential evocations.

Duchamp's² employment of puns, word games and nonsense language in the construction of meaning or what some might call anti-meaning are also relevant to this inquiry. Walter Redfern has written usefully on the subject of puns:

It is time to turn mobile. My gait will be oscillating, because word play is self-evidently a matter of polarities... all humour and much intelligence, entails an ability to think on two planes at once. (Redfern, 1984)

Duchamp often explores punning language in his works, as titles and/or as visual text. I have previously discussed the importance of puns to emergent meaning. It is the polyvalent nature of the pun that I seek to explore in *The World Generator/The Engine of Desire*. Another Duchampian work is relevant here. The title of one work, *Trebucher*, (Duchamp, 1917) which translates as "Trap," a chess term, was made physical by Duchamp, where the viewer literally "stumbles over" the installation of the work. I have earlier pointed at Saussure's comparison of language to chess. This quality of literalising puns also informed the authorship and/or inclusion of media-elements in the techno-poetic mechanism, as has the notion of condensation of multiple potential readings. The active participation and conceptual engagement of the *vuser* is central to generative, emergent meaning processes. Duchamp speaks about this relation in terms of his work:

All in all, the creative act is not performed by the artist alone; the spectator brings the work in contact with the external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act. (Duchamp, 1989, p.140)

The performative characteristics of interactive art potentially gives rise to emergent poetic construction and thus augments an operative environment of "deciphering and interpreting... inner qualification." (Duchamp, 1989, p.140) Metaphorically, this can be

talked about as fields of meaning which are being brought together through the interactivity of the *vuser*, in which each element acts on the other, shifting the poetic "valence" within a polyvalent expression, as it is conveyed to that *vuser*.

I have earlier discussed Duchamp's relevance in terms of his concept of the "readymade." (Duchamp, 1989. p.141) This concept is central in that the users of the techno-poetic mechanism explore media-elements that have been loaded into the mechanism and are presented as "readymade" media-variables. The users subsequently recontextualise these media-variables. As stated above, Duchamp also qualified or played with the meaning of his "readymades" through punning and/or playful titles. A related labelling function is facilitated in virtual space, within the techno-poetic mechanism, through the proximity of text to other media-elements within the virtual space. Unlike Duchamp's concept of the "Readymade", these elements have very specific authored aesthetic properties. In all, it is Duchamp's interest in an economy of means, bringing together a layered constellation of inter-conveying mutable media-elements, that contributes a salient approach to emergent experience, and thus, can be seen as central to my project.

1 See also the *A Typographic Version by Richard Hamilton of Marcel Duchamp's Green Box* (Hamilton, 1960)

2 I have previously discussed other relevant works of Duchamp in my thesis for my Master of Science in Visual Studies degree from Massachusetts Institute of Technology, *An Examination Of A Specific Network of Poetics from the Realm of Language/Image/Sound Relations*. (Seaman, 1985) The thesis was presented for the degree of Master of Science in Visual Studies by Bill Seaman at the Massachusetts Institute of Technology, Cambridge Massachusetts. 1985. Research was conducted at The Media Lab and at the Center for Advanced Visual Studies.

2.1.13 Condensation and Potential — An Enfolded Economy

Central to the understanding of the literary history of the techno-poetic mechanism is the concept of folding and enfolding. The polyvalent qualities of the word "fold" allow for multiple readings in alternate contexts, and as stated above this is a feature which is common to my device. The techno-poetic mechanism also enables the exploration of multiple readings emanating from an individual context. This enfolding of readings makes the use of the word "fold" a meta-concept in that multiple understandings of the word fold are collapsed within the word itself. The word fold, "folds."

The active potential of a particular media-element is constructed through the condensation or enfolding of a series of different foci into a single media-element. Here the notion of an economy of means, a condensing of potential content, becomes essential. Eisenstein, in his use of montage, was well aware

of the functionality and economy of each of his shots. Jacques Aumont, Eisenstein's biographer, states:

The film would thus *condense* different meanings into a single element of representation, if not a single signifier, rather like the Freudian model. The result of this wilful "economy of means" is that there is not need for the film to produce explicit meanings; much of the work is then done in the spectator's mind as he "processes" the associations... inscribing in the film the paths of these associations, through operations of a metonymic principle. (Aumont, 1987, p.167)

This strategy of condensing content is potentially employed with different media-elements within the techno-poetic mechanism: through sound, the layering of different elements, text, utilising puns and portmanteau words — all exploring condensed content in the manner described above, promoting viewer association. Different juxtapositions potentially elicit a field of associations out of these condensation nodes. An emergent set of differing associations in the *viewer* is potentially stimulated in terms of the perception of alternate configurations of media-elements. It is here important to observe Freud's ideas about condensation in terms of the dream-like nature of my recombinant poetic environment. In *The Interpretation of Dreams* Freud provides the following concepts:

The Work of Condensation:

The first thing that becomes clear to anyone who compares the dream-content with the dream-thoughts is that a work of condensation on a large scale has been carried out. Dreams are brief, meagre and laconic in comparison with the range and wealth of the dream thoughts. If a dream is written out it may perhaps fill half a page. The analysis setting out the dream-thoughts underlying it, may occupy six, eight, or a dozen times as much space. (Freud, 1965, p.313)

Condensation is also exhibited within the material we encounter through the techno-poetic mechanism. I have earlier described approaches to the condensation of content in media-elements.

Another means of condensing content deals with the exploration of anagrams. It is interesting to note the extent to which Saussure explored an analysis of anagrams. Starobinski, in his book *Words Upon Words* (Starobinski, 1979, p.vii) points out Saussure's somewhat obsessional research:

Ferdinand de Saussure probably began his research into anagrams in 1906, continuing this work until the early months of 1909. If we judge by the number of notebooks he devoted to the subject, he gave it a great deal of time. To be sure, not all of these notebooks are the same size and not all of their pages are filled. Nonetheless, they represent an impressive effort. (Starobinski, 1979, p.vii)

In terms of my project, we can see another relevance in the use of anagrams.¹ They function as internalised conceptual machines, where the reader/*vuser* unravels their combinatorial encoding. This employment of anagrams is particularly important in that the individual "letters" carry little or no meaning in themselves. Interestingly, anagrams take on a set of differing meanings conflating the series of fields that are intermingled through the thought processes of the reader — their active projection and association.

Any time that a compression is employed in terms of media-elements, a potential internal set of conceptual relations is initiated. These internal musings contribute to the resonant reading of the poetic environment, to emergent meaning. Central, also, is the relative nature of symbols, as explored within the discourse mechanism in terms of the construction of context over time. Starobinski outlines the following in terms of the relative identity of the symbol:

Where is its identity now? In general, one responds by smiling, as if this [Saussure's interest in anagrams, emphasis Seaman] indeed were a curiosity, disregarding its philosophic significance, which goes so far as to state that any symbol, once in general circulation — and symbols exist only because they are in circulation — is absolutely incapable of defining at any given instant what its identity will be at any subsequent instant. (Starobinski, 1979, pp.4-5)

The work *The World Generator/The Engine of Desire* seeks to experientially unpack this observation through the literal interactive "circulation" (Deleuze and Guattari, 1987, p.21) of symbols and polyvalent media-elements. When we explore the identity of a symbol over time, across a series of generated contexts, we observe identity at its own demise. This is only a demise from the standpoint of some notion of a fixed, stable meaning, as opposed to the pluralistic concept of emergent meaning. In terms of poetics, we can seek to intentionally generate a plurivocality, pointing to the emergent nature of the multiplicity of a given "symbol" as it is experienced within alternate contexts, over time.

¹ Duchamp, a contemporary of Saussure, was also interested in anagrams. One of his most famous was "Anémic Cinéma." (Schwartz, 1970, p.51)

2.1.14 New Spatial Literary Forms

Along with the employment of puns and anagrams drawing from a long literary history, we may also define strategies which articulate new literary approaches. Technological systems open up the potential of exploring entirely new spatial literary forms within virtual environments through the positioning of these condensed entities. In *The World*

Generator/The Engine of Desire, text can take on differing behaviours, be layered in a visual/sonic mass¹, be distributed in a spatial environment, shift conveyance in relation to the behaviour of other media-elements, and explore hyperlinks bridging virtual and more standard textual spaces.

¹ See also Jim Rosenberg for his exploration of layered masses of poetic text, Rosenberg, 1991, <http://www.well.com/user/jer/openings.html>

2.1.15 Stéphane Mallarmé

Stéphane Mallarmé is a pivotal force in terms of exploring emergent meaning and is relevant to informing the construction of the techno-poetic mechanism. Mallarmé's *A Throw of the Dice will Never Annul Chance* (Caws, 1982) is a poem in which the reader can navigate.¹ The poem enables the reader to move through different potential trajectories across the text. The text is spread across a series of pages, exploiting various scales of font and variable word spacing.

Mallarmé's work was another significant influence for Duchamp (Duchamp, 1989) and is important to a historical survey examining mechanisms exploring emergent meaning because navigation brings about shifts, re-understandings and additional accretive time-based meanings for the text. Barthes points toward the performative in Mallarmé's work:

Though the sway of the Author remains powerful (the new criticism has often done no more than consolidate it), it goes without saying that certain writers have long since attempted to loosen it. In France, Mallarmé was doubtless the first to see and to foresee in its full extent the necessity to substitute language itself for the person who until then had been supposed to be its owner. For him, for us too, it is language which speaks, not the author; to write is, through a prerequisite impersonality (not at all to be confused with the castrating objectivity of the realist novelist), to reach that point where only language acts, "performs" and not "me". Mallarmé's entire poetics consists in suppressing the author in the interests of writing (which is, as will be seen, to restore the place of the reader). (Barthes, 1977, p.143)

It is this notion of extending the possibilities of authorship into the realm of inter-authorship, where the *vuser* takes an active role in the construction of the text, that I am exploring; I am literally positioning textual elements and subsequently moving through them, as well as positioning the text relative to other media-elements. This spatial textual positioning enables a heightened exploration of emergent meaning, one that is brought about through the reader/participant's own personal reception of this generated textual environment.

In his writing, *A Throw of the Dice will Never Annul Chance* (Caws, 1982), Mallarmé used the analogue function of the spacing on the page to suggest multiple passageways through the text. This spacing facilitated subtle shifts in context based on the perceptual behaviour of the reader, and presented a specific structuring methodology that functions as a conceptual machine. His specific use of particular vocabulary, employed to enfold a series of potential readings, also elicits multiple interpretations within the work. In "The Open Work" Eco comments on this strategy in relation to Mallarmé:

The important thing is to prevent a single sense from imposing itself at the outset of the receptive process. Blank space surrounding a word, typographical adjustments and spatial composition in the page setting of the poetic text — all contribute to create a halo of indefiniteness and to make the text pregnant with infinite suggestive possibilities. (Eco, 1989, p.8)

This "infinite suggestive" quality is brought into play through the techno-poetic mechanism's non-closure as well as through the spatial relations mentioned above. The techno-poetic mechanism is paradoxically closed and open simultaneously. It is closed because the variables are fixed in number, yet it is open because the recombination and interpenetration of media-elements gives rise to new evocations where potential permutations approach the infinite. Mallarmé was also interested in writing the "total book." Deleuze discusses this in *The Fold: Leibniz and the Baroque*.

It is well known that the total book is as much Leibniz's dream as it is Mallarmé's, even though they never stop working in fragments. Our error is in the believing that they did not succeed in their wishes: they made this unique book perfectly, the book of Monads, in letters and little circumstantial pieces that could sustain as many dispersions as combinations. The monad is the book or the reading room. The visible and the legible, the outside and the inside, the facade and the chamber are, however, not two worlds, since the visible can be read (Mallarmé's journal) and the legible has its theatre (both Leibniz's and Mallarmé's theatres of reading). Combinations of the visible and the legible make up "emblems" or allegories dear to the Baroque sensibility. We are always referred to a new kind of correspondence or mutual expression, an entr'expression, fold after fold. (Deleuze, 1993, p.31)

It is the notion that a work can sustain "as many dispersions as combinations," which is central to my techno-poetic mechanism. The extension of the realm of the author through computer-based means is pivotal to research concerned with emergent meaning as seen in relation to the conceptual layering and folding methods of Mallarmé. I have earlier written about notions of inter-authorship in terms of emergent potentials.

¹ There is a rich history to spatial, visual poetry. See the extremely comprehensive book by Dick Higgins entitled *Pattern Poetry: Guide to an Unknown Literature* (Higgins, 1987)

2.1.16 Raymond Queneau and Georges Perec

Raymond Queneau and Geroges Perec were both key players in exploring analogue interactive structuring methodologies. Like Mallarmé, both Queneau and Perec were interested in permutation approached from different generative methodologies. One analogue mechanism Queneau devised enabled an exponential growth in the permutability of a set of authored elements comprising a given work. His work *Cent Mille Millions de Poemes (One Hundred Million Million Poems)* (Queneau, 1961) exemplified the notion of a poetic structure which could be recombined to form new poems:

For this "collection" Queneau wrote 10 sonnets, each having fourteen lines that are complete in themselves as units of meaning. He then placed the 10 sonnets together sequentially, one atop the other, cut each one so that the reader can open the fourteen lines of each poem and combine the lines of all the poems freely. (Thiler, 1985, p.51)

We could say that this analogue mechanism was another example of the conceptual machine. Perec¹ also explored permutation techniques, where the participant/reader could examine a book exploring sections in differing orders. Where Queneau and Perec utilised rudimentary forms of analogue technology (specially designed books) to empower the reader to generate their work, I have been exploring advanced technological systems, enabling new forms of emergent operative computer-based media exploration.

¹ See *The Poetics of Experiment: A Study Of The Work of Georges Perec*. (Motte, 1984)

2.1.17 J. L. Borges

Another literary figure exploring combinatorial permutations in the form of a description in a story, is Borges. In *Labyrinths*, he describes the use of a combinatorial strategy in the construction of a language system. He here describes his massive permutation library, *The Library of Babel*:

The library includes all verbal structures, all variations permitted by the twenty-five orthographic symbols, but not a single example of absolute nonsense. [as derived through the permutation of the symbols, emphasis Seaman] (Borges, 1962)

Here, we have a text-based conceptual machine constructing a permutation system, here established through prose. This description points toward the potentials of an emergent, computer-based combinatorial environment. Where Borges suggests an environment without a "single example of absolute nonsense," as earlier stated, I have at times chosen to explore a specific Nonsense Logic to enable pointed experiential explorations of emergent meaning.

2.1.18 James Joyce — Experimental Language Use and a Further Examination of the Pun

I have earlier quoted Barthes speaking about the active, generative and perceptual behaviour of the reader. This tissue of "perceptual interweaving" (Barthes, 1975, p.64), earlier described by Barthes, is exemplified in the texts of James Joyce — his exploration of experimental language use (or what some might call misuse). Experimentation of this kind takes many different forms and generates an arena of observation for emergent meaning. *Finnegan's Wake* pushes to the limit the concept of prose. It is the chosen juxtaposition and sometime collision and/or superimposition of conceptual fields that is of interest here. The notion of a forking compression of potential readings is central to the techno-poetic mechanism. In a related statement, Culler, in "In Pursuit of Signs", points toward the importance of the transgressive to discourse:

As explorations both of the power of language to create thought and of the limits of discourse, works of this sort [linguistically transgressive, emphasis the author] constitute a radical contribution to a theory of signs and signification, for they show the impossibility of treating signification as a purely code-like phenomenon. When they appear in literature, as they do, new lexical items will be given some kind of meaning by readers (consider Joyce's "stay us wherefore our search for the tighteousness" or Carroll's "'brillig") and syntactic combinations one would have thought impossible will be interpreted... Criticism attuned to semiotics interprets works as semiotic explorations. (Culler, 1981, p.37)

It is the possibility of generating emergent linguistic/environmental relations that is one focus to my project. My mechanism seeks to "transgress" current critical modes and explore potential new realms of the linguistic¹ as well as discursive practice within an electro-spatio environment². Ulmer, in *Applied Grammatology* suggests the following.

Against Husserl's endeavor to reduce or impoverish language in the interests of univocality, Derrida (setting his future course) poses the example of James Joyce, who exploited equivocity: "to repeat and take responsibility for all

equivocation itself, utilizing a language that could equalize the greatest possible synchrony with the greatest potential for buried, accumulated and interwoven interpretations within each linguistic atom, each vocable, each word, each simple proposition, in all worldly cultures and their most ingenious forms. (Ulmer, 1985, p.143)

The techno-poetic mechanism seeks to extend "equivocality" into a computer-based spatial environment, where language-vehicles function as instruments of emergent meaning.

1 See Gregory Ulmer's *Applied Grammatology: Post(e)-Pedagogy from Jacques Derrida to Joseph Beuys* (Ulmer, 1985) for an in-depth discussion related to the exploration of new forms of writing, extending Derrida's notions expressed in *Of Grammatology* through differing applied forms.

2 See also the description of linguistic phenomenon by Maturana. "The linguistic domain as a domain of orienting behaviour requires at least two interacting organisms with comparable domains of interactions, so that a cooperative system of consensual interactions may be developed in which the emerging conduct of the two organisms is relevant for both... The central feature of human existence is its occurrence in a linguistic cognitive domain. The domain is constitutively social." (Maturana, 1970, p.41, xxiv)

2.1.19 Fluxboxes

A series of works from the Fluxus movement are relevant to an examination of emergent meaning. In particular a genre of works called Fluxboxes. This genre would also include Fluxkits and Flux Yearbook Boxes. These works are relevant to the construction of a device exploring emergent meaning because they are housings for collections of varying media-elements, they present game-like situations for emergent media-exploration and they suggest exploration of the boxes through instructions and/or qualifying texts. In the book *Fluxuscodex* by Jon Hendricks (Hendricks, 1988) we can see a multitude of examples from this genre, including works by a diverse selection of artists. This list includes George Brecht, Yoko Ono, George Maciunas, Nam June Paik, Ayo, Toshi Ichihyashi, S. Morita, Ben Vautier, Joseph Beuys, Jackson MacLow, Henry Flynt, Geoff Hendricks, Alice Hutchins, Joe Jones, Alison Knowles, Shigeko Kubota, Benjamin Patterson, Thomas Schmit, Daniel Spoerri, Robert Watts, Chieko Shiomi and Mieko Shiomi. A complete examination of the performative nature of Fluxboxes falls outside the scope of my project. These boxes, along with their instructions, function as another form of conceptual machine.

2.1.20 Roy Ascott

Along with his various textual observations about the field of interactive art quoted throughout this text, Roy Ascott also produced a body of work which can be seen as

a precursor to the techno-poetic mechanism. His show, *Diagram-Boxes and Analogue Structures*, from 12 February - 1 March 1963 at the Molton Gallery, presented a set of diagrammatic works which enabled the participant to bring about relative juxtapositions. Ascott states in the catalogue to the show:

Cybernetics has provided me with a starting point from which observations of the world can be made. There are other points of departure: the need to find patterns of connection in events and sets of objects; the need to make ideas solid (working in wood, etc.) but interfusable (transparent panels, hinged sections), an awareness of change as fundamental to our experience of reality; the intention to make movement a subtle yet essential part of an artifact. (Ascott, 1963)

Although Ascott's methodology was analogue in nature, his drawing on cybernetic concepts is relevant to my own project. Ascott's *Video-Roget Thesaurus*, 1962 [where video referred to vision, as explained to Seaman in conversation with Ascott, emphasis Seaman] is a fascinating example of a conceptual/combinatory structure. In particular, he presented a schematic flow diagram in the catalogue which functions as a conceptual machine of ideas, relevant to the conveyance of the work. I will here present the main concepts. Ascott's diagram, where flow lines made the concepts operational, included the following statements:

SOCIETY AS AN ORGANISM, requiring vigilant inspection and a viable programme for planning at all points.

A CONTINGENT ENVIRONMENT

ULTRASTABILITY

ART AS GOVERNANCE

Purposive behaviour of the artist to feed back information to effect social reform.

ARTIFACT AS CATALYST FOR CHANGE
of state in social system.

Artifact as autocatalyst.

INDUSTRIAL CHANGE

"As an applied science cybernetics aims to produce the instruments of a new industrial revolution." Boulanger

Theory of messages

CLARITY AND CONTROL
thought development

means of communication

Shelters
Transportation
Means of production

ARTIFACT AS SIGNPOST TO THE GENERAL GOOD

EPISTEMOLOGICAL HARDWARE

An artifact may reveal the contingent nature of entities. Metaforms may serve to discuss connections and relationships in events and entities.

ART AS ABDUCTION

Art may embrace the process of arriving at new kinds of rules or logical models.

SYSTEM SOUNDING

Apparently dissimilar assemblies and processes may be shown to have common characteristics.

The artist is free to speculate (visually) about the SYSTEM which is the organisation of an event or entity, not simply about its vital nature.

STRUCTURE

The study of a structure in an entity is useful as index of the performance that may be expected from it.

Work Pattern for Diagram-Boxes & Analogue Structures.

DIAGRAM-BOX AS ANALOGUE

the concept of human behaviour if and only if a spectator participates.

DIAGRAM-BOX AS VARIETY ACT

The (reference) frame provides a SET of panels (states). The VARIETY of the set is a measure of the uncertainty involved.

PARTICIPATION-INFORMATION

Moving the panels can be thought of as removing uncertainty about a set of possibilities. Active observation produces information. In manipulating each different artifact in turn, the participant becomes ADAPTIVE CONTROLLER.

DIAGRAM SPACE allows for the coexistence in any given construct of both iconic and signs for ideas.

VIDEO-ROGET

This thesaurus is a statement of my intention to use any assembly of diagrammatic and iconographic forms within a given construct as seems necessary.

(Ascott, 1963)

The operational concepts that Ascott develops above, highly informed by cybernetics, are very much relevant to the production of the techno-poetic mechanism. One could say that I have transposed many of these concepts into operational computer-based form within my generative virtual environment. I was unaware of this text until late in the stages of the development of my work. Thus, here it serves as a confirmation of related interests.

I have discussed approaches that are relevant to the production of a device to explore emergent meaning. I will later sum up these approaches in the chapter entitled *The Enfolding of Approaches: Toward A Conflation of Language-Vehicles Within a Generative Virtual Environment*. In the next chapter I will continue by focusing on a bridging of the artistic, philosophical and literary, with the technological.

2.2 Bridging the Artistic, Philosophical and Literary with the Technological: Conceptual Machines

The techno-poetic mechanism bridges and enfolds the artistic, philosophical and literary with the technological. I have discussed conceptual machines, above, from various perspectives. I have earlier focused on the dynamic relation that explores the association of the *vuser*, as it relates to their behaviour within the techno-poetic mechanism. It is the desire of the *vuser* that drives their interactivity with the device. In *Anti-Oedipus*, Deleuze and Guattari discuss the related notion of "Desiring-Machines." (Deleuze and Guattari, 1983, p.5)

Desiring-machines are binary machines, obeying a binary law or set of rules governing associations: one machine is always coupled with another. The productive synthesis, the production of production, is inherently connective in nature: "and..." "and then..." This is because there is always a flow producing machine connected to it that interrupts or draws off part of this flow (the breast — the mouth). And because the first machine is in turn connected to another whose flow it interrupts or partially drains off, the binary series is linear in every direction. Desire constantly couples continuous flows and partial objects that are by nature fragmentary or fragmented. Desire causes the current to flow, itself flows in turn and breaks the flows... (Deleuze and Guattari, 1983, pp.5-6)

The "conceptual machine" that brings about the functionality of the techno-poetic mechanism functions as a "desiring-machine." This is particularly relevant to my project in that I am specifically exploring interaction between biological and electro-mechanical entities within an organism-like, self-organising system. It is also relevant that emergent meaning is produced as a product of this desire. In the article *Generative Systems in Visual Art* Diane Kirkpatrick states:

Visual Artists today seem to be drawn to two divergent kinds of systems. Through the transformation of visual information, both systems offer insights into some of the ways in which we understand the world, some of the ways in which our perception functions and some of the ways we think about perceptions of information. The first system sets up a closed analytic structure which becomes a generator as each of its possible internal relationships is explored and made visible. Much of the work with such a system falls under the critical label of "conceptual art." The second kind of artistic generative system creates one work or idea that uses that to generate the next, which in turn generates the next and so on. (Such a system is closer to the sort which Ludwig Bertalanffy calls "organic systems," while a closed analytic system resembles what Bertalanffy terms "analytic machine theoretical.") (Kirkpatrick, 1983, p.17)

The kind of "insights" that Kirkpatrick discusses are central to my project where I have sought to create both a "poetic" system as well as a functioning discourse mechanism: a meta-machinic assemblage (Deleuze and Guattari, 1987, pp. 144 –146) that enables

engagement with specific juxtapositions of media-elements and promotes "insights into some of the ways in which we understand the world, some of the ways in which our perception functions and some of the ways we think about perceptions of information." (Kirkpatrick, 1983, p.17) This mechanism facilitates the exploration of emergent content related to the second class of generative systems she describes, where one work or idea is used to generate the next, "which in turn generates the next and so on."

I will seek here to further clarify the notion of the conceptual machine. A "conceptual machine" can be defined as a machine engendered by language and in some cases through images, functioning as an agent of production in a generative system. The conceptual machine may be manifested through:

- language or images "translated" into an operative machinic system (as in the Jacquard loom and Analytical Engine);
- a recipe as in the cut-up works of Lewis Carroll, Tristan Tzara and other Dada and Surrealist artists, William Burroughs and Brion Gysin;
- a poetic text as in Duchamp's *Green Box*, Mallarmé's *A Throw of The Dice Will Never Annul Chance*, Fluxboxes and operative poetic works by Raymond Queneau, George Perec and Raymond Roussel;
- a description of a process, as in the emergent textual mechanisms of Sol Lewitt and Lawrence Weiner, used to generate visual and/or conceptual works of art;
- a working virtual model or operative diagram as in digital simulations;
- through an algorithm as in computer programs.

In both *Anti-Oedipus* and the Kirkpatrick text, we can make a connection to a series of ideas which were initially explored in terms of cybernetics concerning organism like self-organising systems. The techno-poetic mechanism maintains a form of equilibrium with the elements and processes that constitute it. I have constructed a "conceptual machine" of poetic media-elements and processes, to function in a self-organising manner within a computer-based environment, to facilitate the experiential examination of emergent meaning. The techno-poetic mechanism is a specific example of the "production of production" as described by Deleuze and Guattari. Here, McCorduck elaborates on Ashby's description of the self-organising system:

"The free living organism and its environment, taken together, form an absolute system... the two parts act and re-act on one another." (Ashby, 1952) This notion is not new, not with Ashby or even Wiener, for Ashby quotes scientists as early as 1906 who made the same observations. But Ashby refines it, introducing other concepts such as stability (what MacKay¹ called equilibrium), a mode of survival in the organism. Or in the intelligent system of any description. A key passage focuses this idea: "A determinate 'machine' changes

from a form that produces chaotic, unadaptive behaviour to a form in which the parts are so coordinated that the whole is stable, acting to maintain certain variables within certain limits — how can this happen?" The answer is that the machine is a self-organizing system that responds to stimuli, changing its behaviour and in some sense its shape, in order to achieve stability — what Ashby chose to call ultrastability. (McCorduck, 1979, pp.82-83)

The notion of the "conceptual machine," functioning in a self-organising manner within the physical mechanism of the computer, reflects a focused exploration of the software / hardware paradigm. I have sought to examine relevant literary and artistic history in order to inform the construction of an operative techno-poetic mechanism to explore particular aspects of emergent meaning within an experiential, emergent environment. Instead of the system being "a determinate machine," the emergent nature of the project suggests that I am enabling the creation of a paradoxically "self-organizing" "indeterminate machine," made operational through the construction, interpenetration and navigation of a fixed series of media-elements as explored by an engaged user of the system. In the following chapter I will elucidate a series of relevant technological concepts and devices that are relevant to the project. Although we could mathematically determine every possible state of the computer-based system, we must remember that this system is only operative through time-based interaction. Thus, the vuser becomes an active variable in the system. The interactive time-based behaviour exhibited by alternate *vusers*, thus, make the system indeterminate. An alternate world is generated through each varying use.

1 See Mackay, 1969, *Information, Mechanism and Meaning*.

2.2.1 The Visualised Conceptual Machine Functioning as a Diagram of Processes Leading to the Generation of Emergent Meaning

The informed fragment is not only a vehicle of artistic content, it is also a vehicle of discourse.¹ The use of combinatorial structures is imperative to a diagram-like examination of mutable, computer-based, environmental context. Another thinker relevant to a discussion of diagrams used in discourse is the American philosopher Charles S. Peirce (1839-1914). Peirce, the "reputed founder of pragmatics, made significant contributions in philosophical and mathematical logic and in particular founded semiotics." (Lechte, 1994, p.145) He was also very much interested in logic diagrams:

What Peirce was primarily interested in, however, was a method of analyzing in detail the structure of all deductive reasoning, including mathematical reasoning; breaking the structure into all of its elements and giving each element the simplest, most iconic geometrical representation possible. In this way the mind would be able to "see" the logical structure in a fashion analogous to seeing a geographical area when you look at a map. "The graphs" he wrote "put before us moving pictures of thought." They render the structure "literally visible before one's very eyes." In doing this they free the structure from all the "puerilities about words" with which so many English logical works are strewn. "Often not merely strewn with them," he adds, "but buried so deep in them, as by a great snowstorm, as to obstruct the reader's passage and render it fatiguing to the extreme."

In addition to making for clarity, Peirce also believed that, once a formal structure had been adequately graphed, it could then be experimented upon in a manner similar to the way a scientist experiments with structure in nature. By altering the graph in various ways, adding to it here, taking away there and so on, one could discover new properties of the structure- properties not previously suspected. In other words, Peirce viewed his graphs in much the same way that Lull viewed his Great Art, as an instrument for the invention and discovery of new truths as well as a device for proving old ones. (Gardner, 1958, p.56)

The techno-poetic mechanism created for my project seeks to posit a form of operative diagram enabling one "to 'see' the logical structure in a fashion analogous to seeing a geographical area when you look at a map." This device enables the observation of visualisations of "many-valued logic" (Rescher, 1993) as well as illogical juxtapositions. The space is a poetic space. In terms of functioning as an art work, a constellation or pattern of elements may appear to be illogical and/or nonsensical. I have elucidated the notion of *Nonsense Logic* in an earlier chapter. My techno-poetic environment is a space of emergent potential, where media-elements function in a variety of ways to explore emergent meaning.

I have earlier articulated Lewis Carroll's relevance to my notion of nonsense logic. Like Peirce, Carroll is interested in diagrammatic instances enabling the elucidation of logical processes. What is interesting about Carroll is that he explores logic both in a formal, scientific manner and through literary means. Carroll's book entitled *Symbolic Logic* is relevant in that it includes a series of visualisation of specific logic diagrams. (Carroll, 1977) More important are Carroll's experiments with fantasy and nonsense. His playful language disruptions, as in his novels, sometimes present a meta-commentary on logic through displacement and language play. Drawing from this form of nonsense exploration as well as the employment of logic diagrams, the techno-poetic mechanism can be seen as a diagram co-extensive with its own territory. The work explores highly logical structures (advanced computer programs) to explore emergent and playful/nonsensical content. Computer code functions through a series of logical

processes. A computer owes its functional lineage to theoretical mathematics, although here, it is functioning as a vehicle for creative, poetic, meaning exploration. Gardner elucidates how the computer-based production can be understood from two different basic perspectives:

The term Boolean algebra is now applied to an uninterpreted formal system that is the simplest, most elementary levels of modern logic. Actually, we should speak in the plural, Boolean algebras, because the system can be axiomized in many ways. Once formalized, it can be given two essentially different kinds of interpretation. It can be interpreted abstractly, within pure logic or mathematics, or realistically by applying it to some aspect of the physical world. (Gardner, 1982, p.125)

I would suggest that there is a third kind of computer-based production which is *of itself*,² reflecting aesthetic abstractions, which may have little relation to the physics and material qualities of the physical world. Every object and/or process presented within the techno-poetic mechanism must logically function in an inter-operative manner in order that the environment be operational, even if the contents of these elements, objects, processes, or texts, are nonsensical. The computer code enabling the operative aspects of this space is by nature extremely complex. It facilitates mutable processes of poetic construction and simultaneously diagrams the generation of certain processes germane to the examination of emergent context.

1 See the earlier chapter *Gregory Ulmer: The Object of Post Criticism and Teletheory*.

2 See (Capurro, 1995) "On Artificiality." Working Paper published by IMES, LCA, Laboratory for the Culture of the Artificial, Univerta di Urbino.

2.3 A Survey of Relevant Technological Systems and Approaches

Human beings have a desire to organise and express their ideas, to entertain intellectual discourse, to manifest creative productions as well as to construct mechanisms that help them to accomplish these desired goals. Multiple devices have been brought to life over time that are relevant to the exploration of emergent meaning. The following section examines a diverse set of technological contributions that function toward the accomplishment of the aforementioned goals. This section has not been organised to show that each device has led to the next in an orderly, chronological fashion but to show the inception of a series of diverse technological innovations. It must be noted that each device exists over time, has a "life" of its own, is relevant for many years and in many cases, overlaps or coexists with other developments.

One invention central to the history of computing is the Jacquard loom. The Jacquard loom ran through the reading of mechanical instructions from punched cards. I have mentioned above that these cards function as a conceptual machine within the hardware of the loom. The output of this system was patterned fabric that enabled analogue recombination of particular aesthetic elements on a precise scale.

We can make a "genetic" analogy by tracing the genealogy of the computer from this initial pattern of weaves facilitated by the Jacquard loom to the fabric of contemporary communication: images and texts comprised of pixels. Currently, we have a system, propagated through symbolic logic, which is finally manifested on the outermost level of representation as recombinant configurations of light and sound. We can easily make an analogy between the "output" of fabric and the output of digital images and texts.

I will make here some observations about symbolic logic. Computer programming potentially functions as operational symbolic logic. When we work with images functioning as operable elements in interactive art, we are enabling a co-mingling of different kinds or levels of symbolic logic as well as facilitating an intermingling of the *vuser* with re-embodied artefacts abstracted and translated from the creative thought of the author into the system through specific code architectures. Computer-based systems connected to actual objects¹ and mechanical devices in real space function in a linked mode through the symbolic logic of computer based information processing.

Numerous artists have also explored this territory through physical interface mechanisms which have the punning role of outwardly functioning as art content, while inwardly communicating in a specific manner with the computer code. In fact this is the operative nature of most interactive computer-based art work — any work which uses an image as an activation device on the interface.

One can also examine the Jacquard loom's production (or output) as the physical manifestation of symbolic logic. A design is made evident through the specific patterning of recombinant elements as derived from an organising mechanism. Content is made manifest through these patterns. In terms of the power loom we can see the punch cards functioning as the key code carriers of a conceptual machine, enabling the potential of the encoded design of the fabric to be manifested physically.

The media-elements in the techno-poetic mechanism are drawn from elements of sound, image and text. It is interesting to note the relation of the Jacquard loom to that of a player piano, a precursor to contemporary computer music. In terms of the player piano, the basic module is the single note. Multiple threads of notes over time form a musical composition. (Blum, 1970, p.44)

One potential means of defining a structure exploring emergent meaning results by the modelling of particular experience and subsequent translation that experience into computer code that can become operative within a particular system [re-embodied intelligence, emphasis Seaman]. In terms of the Jacquard loom, an artist models artistic behaviour and translates it into a code that can be read by the mechanised system. This translation of a "sketch" in turn is trans-substantiated into the form of the final fabric.

More interestingly, we can begin to think of the potential of palpable output: objects constructed from particular combinations of code, be they physical material or pictorial illusions constructed through the mecurial properties of light and sound. We can also see the genetic relative of "the variation in weave controls" (Blum, 1970, p.44) in terms of interactive alteration to particular authored code (a switching of cards if you will), that generates an alternate output by accessing an alternate piece of code. In generating a machine that explores emergent meaning, one can potentially model other contexts of emergent meaning and make them operative. The code must have an operational meaning in order to make the visual and sonic interactive surface meaningfully operational.

From here we make a natural segue to Charles Babbage who spent "most of his life in the vain attempt to manufacture a machine considered by most of his contemporaries to be utterly ridiculous..." (Zientara, 1981, p.9) a machine that took many of its operating principles from the Jacard Loom and applied them to realm of "computing." Zientara elaborates:

Babbage projected the fundamentals on which today's computers operate, but his ideas were met almost universally with a veil of ignorance and misunderstanding. If the technology of the 19th century had been equal to Babbage's genius, a computer would have been built in 1822. But the technology was not there and Babbage was destined to see the fruits of his labor only on paper and in theory. More than a century later, however, Howard Aiken, director of Harvard University's Mark I computer project, remarked, "If Babbage had lived 75 years later, I would have been out of a job." The historic Mark I, completed in 1944, was conceptually very similar to Babbage's machine. (Zientara, 1981, p.9)

Babbage thought that logarithmic tables might be calculated by machinery. (Zientara, 1981, p.9) Using this machine all mathematical tables could be computed by one uniform process. It is also fascinating to note that he was interested in "nautical tables" which could be manipulated and explored without error. The background of research which led to the first computer was driven by questions related to "navigational" models among other foci. In terms of emergent meaning, this relation to navigation can be expressed as the need to both map and locate context as well as to manoeuvre from one context to another within a machinic environment.

It is ongoing computation that enables the techno-poetic mechanism to function and it is the symbolic logic presented in the form of computer code that functions as a conceptual machine, facilitating high level *vuser* interaction within the virtual environment. It is the conflation of two differing functions, the arithmetic and the aesthetic, that enables the exploration of emergent meaning in computer-based environments. One can speculate on the relationship of symbolic thought in the history of poetry to that of computing where Lovelace functions as a fascinating pivotal force, seeing the potential of "translated" symbolic language (as opposed to poetic language) to be explored within the Analytical Engine. The mother of Ada, in reaction to Lord Byron's bohemian behaviour, pushed her toward mathematics, away from the realm of poetics for which her father is noted. We can imagine that it was the marriage of poetics and logic which enabled the intuition in Ada Lovelace to lead her eventually to the notion of computer programming. In the year 1842, hers was a very strange and imaginative understanding of the potentials of code. In her *Notes by The Translator* written to clarify the work *Sketch of the Analytical Engine Invented by Charles Babbage* by L. F. Menabrea, Ada Augusta, Countess of Lovelace, made some very enlightened remarks. In her writings,

which I have earlier quoted, we see the seeds of two different salient characteristics central to an exploration of emergent meaning: the ability to perform multiple operations upon chosen abstract entities, and the potential of those entities be aesthetic in nature, i.e. that the machine might act upon and compose "music."²

One note also infers that a logical system [the Analytical Engine] could operate upon illogical or paradoxical subject matter. Her insightful "Notes" were published in 1842, almost 100 years before Turing would pick up on their potential ramifications.

Two particular elements of computer code, developed by Lovelace, the "loop" and the "subroutine," enable a system which is finite in terms of elements visible to the viewer as well as finite in terms of the code which drives it, yet facilitates a recombinant poetic system which is characterised by non-closure.

Turing's description of the *ACE (Automatic Computing Engine)*, the first digital computer, saw the potential for a machine with programmed responsive, "operative" input and output "organs." (Turing, 1986, p.36) He described this system as being analogous to the mind, suggesting the machine would have "A finite set of states of mind," with the possibility of exploring "groups." We can think of this idea as the initial enabling concept behind the manipulation of constructed modules (or groupings) of particular symbolic entities; in my case, media-elements.

From the standpoint of emergent meaning I am looking at the storage and manipulation of housed media-elements that are constructed through the encoding and manipulation of particular meaning states. Configurations of these media-elements can potentially trigger psychological states in the *vuser* during interaction, when the differing computational states of the computer and the psychic states of the *vuser* inter-mingle through dynamic interaction. By putting the "idea of 'operation' into symbolic form," (Hodges, 1983, p.81) we can entertain these psychological states through engagement within a specific virtual environment.

Turing, in 1946, was already speculating about a computer playing chess in the *Proposal for Development of an Automatic Computing Engine*. (Turing, 1986, p.41) This document suggested the potential of imbuing a machine with intelligent behaviour by exploring machines that function through the "sensing" of *vuser* input, which then "respond" with appropriate output. Already, in 1946, we can entertain the notion of a machine playing recombinant games with a highly engaged interactive participant. This kind of system again addresses the interdependent exploration of levels of symbolic logic bridging cyberspace to the physical space of the chess board — presenting to the

vuser an operative, interactive environment. With continued research into computerised chess, we are also now aware that computers can play chess extremely well.

In relation to the contemporary computing environment, the "Universal Machine," is a perfect vehicle for the manifestation of the creative activity of the artist, because it is a machine that can potentially articulate the pure thought of the artist through digital manifestations of images, sounds and texts; encoded and made operative within an authored, computer-based, environment. It also has the potential for linking actual environments and/or objects with operative symbolic logic, through computer code. This assemblage of authorship presents a highly engaging operative associative environment for the exploration of emergent meaning.

The employment of mechanisms which enhance association, heighten the level of *vuser* engagement. This concept exemplifies one salient feature integral to the development of an art practice exploring emergent meaning. The origins of hypertext are important here. The Memex can be seen as an extension of the discussion of memory devices relevant to my project. Michael Joyce writes about Vannevar Bush's Memex:

Bush describes the Memex, "a mechanical, microfiche-based, see-through desktop, a device in which an individual stores... books, records and communications [that provide] an enlarged intimate supplement to... memory." The Memex, better suited to electronic and digital than to gear-driven information retrieval, was never built. Yet Bush's insistence that "the human mind... operates by association... in accordance with some intricate web of trails carried by the cells of the brain," has influenced all subsequent hypertext theory and development, both in its fundamental attention to cognition and in its conceptual framework and vocabulary. (Joyce, 1995, p.22)

The concept of operative exploration of human memory, through encounters with combinatorial computer memory and the concomitant association that is central to this experience, relates directly to an exploration of emergent meaning within the techno-poetic mechanism. In their study of Vannevar Bush's *As We May Think*, Nyce and Kahn comment:

Computer and information scientists today recognise Bush's article as containing the earliest description of a machine designed to support the building of trails of association through vast stores of information.... Bush's writings on the Memex can be viewed as a proposal for an actual machine and as a body of essays that explore the potential utility and application of new kinds of machines for managing information and representing knowledge. (Nyce and Kahn, 1991, p.39)

In 1945 Vannevar Bush, who was at the time scientific advisor to President Roosevelt, proposed a mechanised library and personalised filing system which he called the

Memex. Although it was never built, Bush's writings and concepts proved to be a stimulus for further experimentation in interactivity. Bush described his system as an intelligent mechanism that could facilitate associative indexing — any selected item could be linked automatically to a related entry.

The relevance of this research to my project is the insight that, in the exploration of works involving recombinant poetic systems, the viewing process involves the active associative participation of the *vuser*. George Landow, in discussing hypertext, also sees the potential for association as triggered by machines that enable the processes of poetic navigation and construction:

Perhaps most interesting to one considering the relation of Bush's ideas to contemporary critical and cultural theory is that this engineer began by rejecting some of the fundamental assumptions of the information technology that had increasingly dominated — and some would say largely created — Western thought since Gutenberg. Moreover, Bush wished to replace the essentially linear fixed methods that had produced the triumphs of capitalism and industrialism with what are essentially poetic machines — machines that work according to analogy and association, machines that capture the anarchic brilliance of human imagination. Bush, we perceive, assumed that science and poetry work in essentially the same way. (Landow, 1992, pp.17-18)

Bush was expositing the potentials of a device that was born of transdisciplinary research. A set of recombinant potentials brought to life through poetic machines has been realised here through virtual mechanisms. The techno-poetic mechanism facilitates navigation through linked texts in a potentially non-hierarchical, non-linear manner. The system's very nature is dynamically recombinant, based on user input. I have used hyperlinks that connect specific choices made from the menu system, to the *plateau* space, i.e. when we makes a particular choice from the virtual menu wheels, we are hyperlinked to the virtual environmental manifestation of that choice. Joyce discusses the beginnings of the technological medium of hypertext as an exciting literary device:

What Vannevar Bush could only imagine, Douglas Engelbart not only imagined but also designed and built. In the process he invented or first put to serious use fundamentals of computer interaction, writing and networking, including word processing, outlining, windows, electronic mail, computer conferencing, collaborative authorship and — not last — the mouse. His 1962 essay, "A Conceptual Framework for the Augmentation of Man's Intellect," led to his development of a full-blown prototype hypertext system NLS (oNLineSystem) at the Science Research Institute in 1968. Renamed AUGMENT, this system was the beginning of Englebart's lifelong exploration into what he terms "a co-evolutionary process — new knowledge processes and new tools evolving together in real working environments." (Joyce, 1995, p.22)

Central to the techno-poetic mechanism is the co-mingling of the *vuser* with an evolving, emergent, authored environment. Engelbart ushered in a new communication era with great potentials related to the field of poetics, as well as an important step toward mechanisms that enable the examination of emergent meaning through appurtenant technological extension. Erkki Huhtamo, in a text on Seaman's work history, described the techno-poetic mechanism as a "World Processor," (Huhtamo, 1997, p.186) bringing the concepts described above into the virtual environment.

Ted Nelson, who coined the term "hypertext" in 1965, came up with the idea for a system (called Xanadu) that would connect all of the world's literature by computer within an environment the viewer could interact with. The world wide web is slowly facilitating aspects of this vision. Michael Joyce comments:

Mind as intertwined "Docuverse" — Nelson and Xanadu.

The last of the founding trinity of hypertext was also its baptizer. Provocateur-humanist, Theodor Holm (Ted) Nelson provided a utopian spirit and encompassing vision (as well as the coinage, hypertext, in the 1960s) to the new world of the mind imagined by Bush and established by Engelbart. Nelson is most likely also responsible for what George Landow has termed the "bizarrely celebratory" quality of writing about and with hypertext. Proceeding from a belief that "literature is an ongoing system of interconnecting documents," (Nelson, 1990), has joyfully and wittingly prophesied and proselytized the coming of a "docuverse" not unlike the linked world (as) text of contemporary computer networks. For decades Nelson has promised to embody the docuverse in his own Xanadu system, an ongoing design prospectus geared toward establishment of a peaceable kingdom of "intertwined" and computerized text on earth. (Joyce, 1995, p.23)

The techno-poetic mechanism brings us to a spatial, post-docuverse environment. Turing had long before planted the seed for a literary memory environment in his *Lecture to the Mathematical Society on 20, February 1947*. He states:

We could even imagine a computing machine that was made to work with a memory based on books. It seems that this can only be done at the expense of compactness and economy, e.g. by cutting the pages out of a book and putting each one in to a separate reading mechanism... If we are to have a really fast machine then, we must have our information, or at any rate a part of it, in a more accessible form than can be obtained with books." (Turing, 1986, pp.107-108)

We can think of literature as one means of transmitting the highest level of pure thought of an author through the analogue technology of the book. The techno-poetic mechanism enables the perusal of digital, spatial text.

It wasn't until a sophisticated editing system was created that the principles for hypertext could be implemented for a real-world purpose. In 1967 the Hypertext

Editing System and FRESS (File Retrieval and Editing System) were built at Brown University, Rhode Island, under the leadership of Van Dam, a contemporary of Nelson. FRESS was the first step in creating a functioning user-controlled, interconnected, language system.

Along with hypertext came the potential to literally and metaphorically "drive" external media devices from the computer. At this point in time non-linear search engines could call up modular segments of video from a videodisc with much greater resolution and speed than they could access encoded digital material. Digital video was just beginning to be explored. *The Aspen Movie Map* (Nielson, 1989, p.89) was the first hypermedia videodisc. It was created by Andy Lippman and the Architecture Machine Group³ at Massachusetts Institute of Technology in 1978. Like hypertext, hypermedia systems make intelligent links between various kinds of entered material, including video, audio and text. *The Aspen Movie Map* was an elaborate documentation of the streets of Aspen, Colorado. By manipulating a joystick the viewer could gain access to footage shot with four cameras placed at 90 degree angles on a car. The system linked this visual and spatial information in order to simulate the actual movement of a car. This system was an early example of a "mapped" video-virtual environment. A user could "drive" the four videodisc players by utilising the joystick interface, which would give the illusion of moving through Aspen. Digital video now enables the computer to both house, operate on and play, digital video material, as exemplified within the techno-poetic mechanism.

Elastic Movies 1983 was one of the first computer-controlled videodiscs to function as an art work in its own right. The work was the product of a class of which I was a contributing member, at the Massachusetts Institute of Technology, which was run by Benjamin Bergery and Glorianna Davenport in the Film/Video section. In a workshop environment, many of the potentials of interactive art were discussed and later facilitated. Another computer controlled videodisc project at MIT was the *Sky Disc* project, directed by Russ Gant. The work amassed reproductions of artists work related to the Center For Advanced Visual Studies as well as a Sky Art Conference. The former functioned as a art work in its own right, where the reproduction is the original work of art, the latter was a housing for reproductions and documentation of art works. Videodisc presented a highly recombinant, operative medium which could be explored through computer control. The artists Lynn Hershman-Leeson (then Lynn Hershman), Grahame Weinbren, Peter D'Agostino, Michael Naimark, Ken Feingold and myself (among others), all, early on, explored the recombinant nature of interactive videodisc. A full recounting of the interactive work of these artists falls outside of the scope of this document. The general relevance of these works to my project is an exploration of

recombination, non-linearity, modularity in terms of media, as well as the potential of navigation and interactivity through computer-mediation.

We must be aware of qualities of interactivity in terms of levels of engagement. The exploration of computer-controlled videodisc as a medium has many potentials. The versatility of the virtual environment has proven to be more appropriate for my project. Where interactive videodisc enables recombination of video, sound and text, the virtual environment presents a qualitatively different engagement with the spatial experience of chosen media as well as the potential for engaging processes to further abstract, digitally process and/or act upon that media.

Myron Krueger envisioned the responsive, interactive potential of computer-based artificial realities (his term for virtual reality). Krueger writes:

The responsive environment has been presented as the basis of a new aesthetic medium based on real-time interaction between men and machines. In the long range it augurs a new realm of human experience, artificial realities which seek not to simulate the physical world but to define arbitrary, abstract and otherwise impossible relationships between action and result.

We are incredibly attuned to the idea that the sole purpose of our technology is to solve problems. It also creates concepts and philosophy. We must more fully explore these aspects of our inventions, because the next generation of technology will speak to us, understand us and perceive our behaviour...The design of such technology is an aesthetic issue as much as an engineering one. We must recognize this if we are to understand and choose what we become as a result of what we have made. (Krueger, 1977, pp.423-433)

This premise is central to my project, where I have sought to intermingle the technological with the artistic. Myron Krueger specifically points in this direction when positing the history of Virtual Reality. In his essay "The Artistic Origins of Virtual Reality," he writes:

The dawn of Virtual Reality is most often traced to a paper by Ivan Sutherland presented at the national computer conference in 1965⁴ and another written by him in 1968⁵. There were also two relevant dissertations at the University of North Carolina in 1970 and 1976.⁶ Otherwise, during most of the 70's and the first half of the 1980's, the idea of virtual reality was dormant in the technical community, except for the classified work of Tom Furness in the U.S. Airforce. (Krueger, 1993, p.148)

He later continues:

The premise of this essay is that the ideas [related to virtual reality, emphasis Seaman] were actively pursued in the arts from the beginning, that virtual reality's rebirth as a technical field was triggered by the efforts of artists and that

increasingly the involvement of artists now would foster more rapid development of the field in the future. (Krueger, 1993, p.148)

In the essay, Krueger outlines the importance of the artist's aesthetic development of Virtual Reality, or what he terms "Artificial Reality." I will here outline a series of different artistic involvements as drawn from Krueger's text:

Mort Heilig's Sensorama, 1960, developed a full-immersion experience involving stereo film and stereo sound as well as "physical" feedback attributes; Salvitori Martirano in the 60's explored 3D sound experiences; Michael Noll explored telepresence, stereo viewing apparatus, 3D drawing and tactile communication for visualising dance; Dan Sandine and Myron Kreuger explored computer-controlled responsive environments; the PULSA group led by Patrick Clancy explored large outdoor environments; Aaron Marcus implemented a symbolic, interactive, computer-environment in the early 70's; Krueger's exploration of shared telecommunication space in *Metaplay* 1970 and the *Videoplace* exhibition in 1975; Kit Galloway and Sherry Rabinowitz exploration of telepresence or "composite spaces"; Dan Sandin, Tom Defanti and Gary Sayers development of the Data Glove; a later patented Data Glove by musician Tom Zimmerman; research into the head-mounted display by artistically trained Mike McGreavy; artist Scott Fisher's virtual reality work for NASA; Jaron Lanier, musician — interested in exploring musical production in virtual space and president of VPL research; Durand R. Begault, interested in 3D sound; Mark Caniglio's exploration of sensors on dancers; Graham Smith's interest in new forms of unencumbered VR. (Krueger, 1993, p.148)

Since the time of this article many artists have continued this exploration. An elaboration of various virtual works falls outside of the scope of my project. I have, however, focused on a specific set of works which I elaborate on in the next chapter.

Howard Rheingold published an overview of *Virtual Reality*. In it he spoke of Jaron Lanier's coining of the term: "I first heard the terms 'Virtual Reality,' 'VR,' and 'Reality Engine' from a computer scientist named Jaron Lanier."⁷ Rheingold states that Lanier described a computer-augmented 'post-symbolic' communication. (Rheingold, 1992, p.159) Rheingold quotes Lanier stating that, "Instead of communicating letters, numbers, pictures, or musical notes, you are creating miniature universes that have their own internal states and mysteries to be discovered." (Rheingold, 1992, p.16) I beg to differ with Lanier about these environments being post-symbolic. I think of them being qualitatively different symbolic-communication realms as compared to more traditional modes of communication, but symbolic, nonetheless. In virtual environments we are entertaining a new kind of symbol, a layered symbol constructed of levels of the symbolic (computer code as well as visual and sonic output) possibly exhibiting behavioural responsiveness. As virtual space becomes a more ubiquitous space and people live in that space, the symbolic nature of the environment will become more and

more palpable, submerging the symbolic as a nested, coded, layer of reality. Perhaps this is what Lanier is actually suggesting.

It was Ben Shneiderman who coined the term "direct manipulation."⁸ Brenda laurel points to the three key criteria of this methodology:

1. Continuous representation of the object of interest.
2. Physical actions or labeled button presses instead of complex syntax.
3. Rapid incremental reversible operations whose impact on the object of interest is immediately visible. (Laurel, 1991, p.8)

Each of these criteria is central to the workings of the techno-poetic mechanism. In fact, the interface seeks to go beyond this level of authorship through my interface metaphor.

The writings and art practice of Brenda Laurel, including the books *Computers as Theatre* (Laurel, 1991) and *The Art of Human-Computer Interface Design* (Laurel, 1990), have contributed immensely to the field of computer/human interface design in terms of poetics and experimental art practice, although the theatre metaphor, taken entirely, is problematic in terms of my own work. Actors pretend to be someone they are not. This is not my intention within the techno-poetic mechanism. Each *vuser* functions as him/herself, interacting within the generative virtual environment. The plateau space becomes a synthetic space, populated by media-elements and is not unlike a stage set.⁹ I am more interested in equating this space with new forms of spatial collage/montage, sculptural installation, sculptural media environments and aspects of "Expanded Cinema."¹⁰ There is no acting involved. Only elements of play, interactivity and the manipulation and distribution of media-elements as part of a generative virtual environment, witnessed potentially through mindful observation. Laurel is still helpful in elucidating a set of issues surrounding the creation of computer-based environments, both in terms of their technical ramifications as well as their philosophical implications:

Designing human-computer experience isn't about building a better desktop. It's about creating imaginary worlds that have a special relationship to reality — worlds in which we can extend, amplify and enrich our own capacities to think, feel and act. (Laurel, 1991, p.33)

This is one of the central issues surrounding the creation of the techno-poetic mechanism, coming to better understand ourselves and the processes surrounding the production and elucidation of emergent meaning.

1 The Tangible Media Group headed by Hiroshi Ishi, at the MIT Media Lab is exploring this notion, the concept that symbolic logic can be propagated partially by objects, into physical space.

2 See also (Cornwell, 1993) and Sylvia Plant writing on Lovelace in *Clicking In*. (Leeson, 1996)

- 3 Both Rebecca Allen and Michael Naimark were involved with the *Aspen Movie Map* project and have developed their own elaborate interactive bodies of work.
- 4 See "The Ultimate Display," National Computer Conference, IFIPS, 1965, pp. 506 – 508.
- 5 See "A Head-Mounted Display," National Computer Conference, IFIPS, 1968, pp. 757 – 764.
- 6 See James J. Batter and Frederick P. Brooks Jr., "GROPE-1: A Computer display With A Sense of Feel," University of North Carolina, 1970; and P. J. Kilpatrick, "The Use of a Kinematic Supplement in an Interactive Graphics System," a doctoral dissertation, University of North Carolina, 1970.
- 7 See Rheingold, 1992, p.16.
- 8 See Shneiderman, B. 1987. *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. Reading Mass.: Addison-Wesley
- 9 See the sculptural sets of Robert Wilson and the architectonic sculpture of Dennis Oppenheim, Alice Aycock, Mary Miss and Vito Acconci.
- 10 See Minot, 1984, p.7.
- 11 See Youngblood, 1970.

2.4 A Survey of Relevant Music and/or Sound Strategies

A series of diverse strategies and concepts related to music and sound art have come to inform the authoring of the techno-poetic mechanism. This particular section of the dissertation will examine those strategies in terms of emergent experience and, thus, in relation to emergent meaning. It does not in any way represent a complete history of music and or sound art, as it relates to emergent meaning. I have chosen, instead, to focus on a specific set of relevant examples that align themselves with my art practice.

2.4.1 Charles Ives

The first composer that is central to the project is Charles Ives. Ives became interested in musical processes, spatial relations and "behaviours." Cowell and Cowell, in *Charles Ives and His Music* states:

The germ of Ives's complicated concept of polyphony seems to lie in an experience he had as a boy, when his father invited a neighboring band to parade with its team at a baseball game in Danbury, while at the same time the local band made its appearance in support of the Danbury team. The parade was arranged to pass along the main street as usual, but the two bands started at opposite ends of the town and were assigned pieces in different meters and keys. As they approached each other the dissonances were acute and each man played louder and louder so that the rivals would not put him off... Ives has reproduced this collision of musical events in several ways: From it, for example, he developed the idea of combining groups of players (sections of the orchestra) to create simultaneous masses of sound that move in different rhythms, meters and keys. (Cowell and Cowell, 1969, pp.144-145)

In this experience, the traditional notion of context was breached and a spatial notion of juxtaposition and sonic relativity was explored. (Cowell and Cowell, 1969) Ives explored spatial acoustic relations in his work "The Unanswered Question" by positioning the musicians around a room in a particular manner. Another aspect related to the music of Ives, central to this project, was his recontextualisation and abstraction of folk music. We can directly relate this to the use of sampling in terms of contemporary technological "folk" music. I abstract the samples as does Ives, the snippets of folk tunes:

When Ives cites a familiar tune, it will often be somewhat distorted in rhythmic or pitch relationships, perhaps incomplete or overextended. Not only, then, may we suddenly realize a rich complex of remembrances, with their attendant connotations, but this in turn is being counterpointed against by the expectational surprises Ives has written into the familiar: well known shapes blur and shift before our attention. (Childs, 1981, p.122)

Sound sampling, a process that enables a sound or group of sounds to be digitally recorded and altered in numerous ways, can potentially be culturally "referential," although I have chosen to highly abstract these samples. Digital sound samples can potentially be continuously re-positioned and musically re-contextualised within the techno-poetic mechanism. Technologically empowered recombination enables new forms of juxtaposition and the relative abstraction of sonic material through direct user/listener interaction. Technology now enables new forms of spatial, rhythmic and tonal juxtaposition within virtual environments. The above notions explored by Ives are relevant to an exploration of emergent meaning as experientially entertained within the techno-poetic mechanism. Brandt suggests: "Ives realized both the complexity and the simultaneity of human experience; he also saw that in many ways the two are not independent of one another." (Battcock, 1981, p.223)

2.4.2 The Futurists

The Italian Futurists had explored noise producing analogue devices: The Futurist Noise Intoners or "Orchestra of Intonarumori." These "noise instruments" developed by Luigi Russolo (Kahn and Whitehead, 1992, p.141) after being described in the manifesto, "The Art of Noises," 1913, (Perloff, 1986) present an alternative to traditional instrumentation and function as a prelude to the strategies of Cage. The relevance to the project is that the user of these "instruments" could "trigger" specific noises with relative ease and without traditional notions of virtuosity.

2.4.3 John Cage

Following after Ives and the Futurists, another composer exploring the nature of sound in its fullest capacity is John Cage. Many strategies developed by Cage can be seen as relevant to my project. The most important suggests the employment of any sound in the production of music, including noise. Cage states:

Wherever we are, what we hear is mostly noise. When we ignore it, it disturbs us. When we listen to it, we find it fascinating. The sound of a truck at 50 miles per hour. Static between stations. Rain. We want to capture and control these sounds, to use them, not as sound effects, but as musical instruments... (Cage, 1967, p.3)

The importance of Cage was his emphasis on shifting sound production from analogue to electronic devices. Another relevant strategy from Cage deals with the "organization

of sound." Organisation and reorganisation of musical elements, made operative for the user/listener through technological means, can be seen as central to *recombinant* strategies of making music.

If the word "music" is sacred and reserved for eighteenth- and nineteenth-century instruments, we can now substitute a more meaningful term: organization of sound. (Cage, 1967, p.3)

As stated above, Cage saw the potential of electronic equipment for the "organization of sound." "[The use of noise, emphasis Seaman] will continue and increase until we reach a music produced through the aid of electrical instruments." (Cage, 1967, p.3) In researching the creation of an electronic mechanism for the exploration of sound as well as other media combinations, it is an important goal for this device to function in part by reflecting the ephemeral nature of meaning within our contemporary information environment. By abstracting relations from the world at large and poetically reflecting these relations through an experiential system, we can begin to directly sense the fleeting qualities inherent in the construction of context. The techno-poetic mechanism potentially empowers the participant to observe the nature of sonic contextualisation, decontextualisation and subsequent recontextualisation of chosen material, within a constructed technological environment.

Cage was particularly interested in chance methods, to operate in the manner of nature:

Those involved with the composition of experimental music find ways and means to remove themselves from the activities of the sounds they make. Some employ chance operations, derived from sources as ancient as the Chinese *Book of Changes*, or as modern as the tables of random numbers used also by physicists in research. (Cage, 1967, p.10)

The topic of chance was extensively explored by Cage. Cage has stated in relation to the employment of the *I Ching* (Wilhelm [Edition], 1967), "If I want to know which sound of one hundred sounds I'm to use, then I use it just as a computer." (Kostelanetz, 1988) Whereas Cage was interested in chance to derive an unknown, experimental linear outcome; the goal of my recombinant sonic environment is to employ chance to provide for a potential set of probable outcomes, based on the process of user generated construction and navigation within this inter-authored domain, where the system is loaded with specifically authored fields of sound.

Cage was also interested in notions related to indeterminacy. I have earlier described how the techno-poetic mechanism might be seen as an indeterminate machine.

This is a lecture on composition which is indeterminate with respect to its performance. This composition is necessarily experimental. An experimental action is one the outcome of which is not foreseen. Being unforeseen, this action is not concerned with its excuse. Like the land, like the air, it needs none. A performance of a composition which is indeterminate of its performance is necessarily unique. It cannot be repeated. When performed for a second time, the outcome is other than it was. Nothing is accomplished by such a performance, since the object cannot be grasped as an object in time. A recording of such a work has no more importance than a postcard; it provides a knowledge of something that happened, whereas the action was a non-knowledge of something that had not yet happened. (Cage, 1967, p.39)

The experiential techno-poetic mechanism created for this project is predicated on non-closure, where each user will encounter a different experience. As Cage has suggested, "in order to reflect nature in her manner of operation," (Cage, 1967) this system will need to explore elements that are "indeterminate" of their performance, enabling the generation of emergent sonic environments of varying complexity that are not known in advance of their production. It is the operative nature of my virtual environment, as well as the possibility of exploring sound/music in an operative, interactive virtual computer-based mixed-semiotic realm, that distinguishes it from the work of Cage.

2.4.4 Eric Satie

A set of interesting musical strategies can be traced to Eric Satie. They includes both an extreme use of repetition as well as a creation of music that could both be ignored as well as focused on — "Furniture Music." Dick Higgins described Satie's strategy of repetition:

Satie composed a piece shortly before World War I, *Vieux Sequins et Vieilles Cuirasses*, a characteristically programmatic piece in which he spoofs the military and glories of nationalism. At the end of the piece there appears an eight-beat passage evocative of old marches and patriotic songs, but which is to be repeated 380 times. In performance the satirical intent of the repetition comes through very clearly but at the same time other very interesting results begin to appear. The music at first becomes so familiar that it seems extremely offensive and objectionable. But after that the mind slowly becomes incapable of taking further offence and a very strange, euphoric acceptance and enjoyment begin to set in. (Battcock, 1981, p.21)

Satie appears to have been fascinated by this effect, because he also wrote *Vexations* (published in John Cage's article in *Art News Annual* '58) an utterly serious 32-bar-piece (although the bar lines are not written in) intended to be played very softly and slowly 840 times. (Battcock, 1981, p.21)

The potential for exploring repetition is facilitated within electronic environments with great ease, enabling different repetitions or "loops" to be juxtaposed and repeated

indefinitely. Repetition can produce particular psychological states in the listener. Unlike the repetition of the Satie, a user navigating within a "recombinant poetic" work, which spatialises the repetition, may change the sound-mix entirely, based on their navigation and choice of sound within the environment. Many simple "loops" functioning together within a spatial domain can produce an emergent musical work of great complexity. Also, repetitive elements perceived over time can potentially generate an emergent experience and concomitantly, emergent meaning.

The "Furniture Music" of Eric Satie also has potential relevance to the authorship of the techno-poetic mechanism. In *Elevator Music*, the author Joseph Lanza states:

Furniture Music, far from being just another smug Dadaist hoax, was Satie's serious attempt to facilitate the simultaneous rise of canned music and movie soundtracks. The cinema impelled musicians to compose viscerally while staying subtle enough not to overscore the screen action, a challenge Satie had met with his score entitled *Cinema* for Rene Clair's *Entr'acte*, in which he cut up, juxtaposed and repeated musical phrases until they were devoid of any intrinsic meaning. (Lanza. p.19)

I would disagree with Lanza in terms of this music being "devoid of any intrinsic meaning." On the contrary, this cut-up stance provides a particular perspective on meaning production. This "cut-up" method, described in the chapter on literary and artistic strategies, is central to recombinational strategies as is music that can be both focused on or ignored.

2.4.5 Brian Eno

In terms of a contemporary artist exploring related strategies within an electronic environment, the ideas of Brian Eno become central. In speaking about *Discreet Music*, Eno stated: "I was trying to make a piece that could be listened to and yet could be ignored... perhaps in the spirit of Satie who wanted to make music that could 'mingle with the sound of knives and forks at dinner.'" (Eno, 1975) Eno has presented many ideas relevant to my project, working initially with analogue audio. His album with David Byrne entitled *My Life In The Bush Of Ghosts* (Eno and Byrne, 1981) explored the "cut-up" techniques of "sampling" and recontextualisation of voices as well as the cross-fertilisation of popular music with more experimental music. Many contemporary music artists explore the notion of the "remix," blurring the line between low and high art, where many versions of a particular piece of music are linearly derived.

Eno was also interested in exploring ideas related to cybernetics, creating "self-generating and self-organising systems" (Eno, 1975) that could in turn generate music. These strategies are translated to the musical realm from cybernetics. (McCorduck, 1979, p.83) Eno states:

Since I have always preferred making plans to executing them, I have gravitated toward situations and systems that, once set into operation, could create music with little or no intervention on my part. (Eno, 1975)

The notion of creating "self-generating and self-organising systems" is central to the generation of music within the techno-poetic mechanism. Recombinant poetic works may also potentially exhibit the qualities that Eno has termed Ambient Music.

Over the past three years I have become interested in the use of music as ambience and have come to believe that it is possible to produce material that can be used thus without being in any way compromised... An ambience is defined as an atmosphere, or a surrounding influence: a tint... Ambient music must be able to accommodate many levels of listening attention without enforcing one in particular; it must be as ignorable as it is interesting. (Eno, 1978)

I am particularly interested in the generation and experiential exploration of emergent meaning in terms of how a sonic environment qualifies the reading of text and image as well as how one sound qualifies another. I have earlier discussed the notion of "felt" meaning arising from this form of complex environment. Eno has been exploring another related area of late. He has coined the term Generative Music¹.

Some very basic forms of generative music have existed for a long time, but as marginal curiosities. Wind chimes are an example, but the only compositional control you have over the music they produce is in the original choice of notes that the chimes will sound. Recently, however, out of the union of synthesisers and computers, some much finer tools have evolved. Koan Software is probably the best of these systems, allowing a composer to control not one but one hundred and fifty musical and sonic parameters within which the computer then improvises (as wind improvises the wind chimes). The works I have made with this system symbolise to me the beginning of a new era of music. Until 100 years ago, every musical event was unique: music was ephemeral and unrepeatable and even classical scoring couldn't guarantee precise duplication. Then came the gramophone record, which captured particular performances and made it possible to hear them identically over and over again. But now there are three alternatives: live music, recorded music and generative music. Generative music enjoys some of the benefits of both its ancestors. Like live music it is always different. Like recorded music it is free of time-and-place limitations - you can hear it when and where you want. I really think it is possible that our grandchildren will look at us in wonder and say: "you mean you used to listen to exactly the same thing over and over again?" (Eno, 1996)

Many similar properties are explored in my experiential mechanism created for this project. I have coined the term Recombinant Music in 1995 to describe music which is

modular in nature and can be layered, combined and recombined through computer-based construction mechanisms. This kind of permutation based music is non-linear and exhibits non-closure. Modular sonic elements can be explored through interactive navigation, triggering "location sensitive" sound objects. This could be a spatial location (as found within virtual environments) or "time-based" locations as found on a video disc, CD-ROM, or other non-linear housing mechanisms. The author's first mature solo Recombinant Music work was an interactive computer-mediated videodisc, entitled *The Watch Detail* (Seaman, 1990)². The techno-poetic mechanism is a Recombinant Music generator.

1 Although Eno has coined the term Generative Music, many musicians have been exploring computer-based generative methodologies for music composition. These include Paul Demarinis and David Behrman among many others. A full recounting of the artists exploring "Generative Music" falls outside of the scope of this research.

2 Early experiments with interactive video and sound can be witnessed on the *Elastic Movies* disc, which involved the author working in collaboration with a group at MIT in 1983, as well as in the author's video work - *Telling Motions* (1986). This author's contribution to the *Elastic Movies* disc was entitled *Dance Haiku*, which explored short haiku-like video and music segments which could potentially be recombined by the user/viewer. Auditory media may be presented in a non-hierarchical, non-linear, modular manner, enabling open-ended, emergent recombination based on user interaction, navigation and/or sonic construction mechanisms. These systems are also potentially characterised by non-closure and self-organisation. In *Telling Motions*, an image/sound/text, cipher system was constructed. A video and poetic text with linear music was constructed. Fragments from this work were given letter designations. Each "letter" was a 10 frame audio/video module. Sections from the text in Part 1 were "translated" into this "code." The code functioned as a kind of "conceptual machine" to construct a series of video edits translating the text. The idea was that any letter on the keyboard of a computer could be used to trigger a corresponding audio-visual edit. Only a linear version of this process was created. This functions as an early example of the potentials of modular Recombinant Music.

2.4.6 Operational Music

Related to modular music made operative in recombinant poetic works is the notion of "Operational Music" as discussed by William Wilson:

Ideas that cluster around operation include the withdrawal of attention from emotional or dramatic development, with the accompanying feeling of completion and fulfilment. Attention is more likely to be undifferentiated, scattered or evenly distributed. This fluctuating attention is possible because of the accompanying withdrawal of point of view on the part of the composer. He is unlikely to be concerned with ideals or ideas that can be abstracted any further than operation. So music finds a reconciliation between the claims of the physical materiality and the ideal spirituality in operations that mediate between the concrete and the abstract. (Battcock, 1981, p.91)

As we come to understand the nature of most interactive structures that include sonic elements, the notion of "Operational Music" becomes central. The techno-poetic mechanism does not specifically seek "emotional developments," only evocative change and/or repetition and differing interpenetration. Wilson continues:

The questions about musical materials, instruments and performers belong with the larger question of what music is. The answer that emerges from some present practice is that music is less a matter of special sensibility, a structure, a quality of sound, an image of time, an expression of feeling, or a significant form, than a series of operations with sounds. (Battcock, 1981, p.91)

Computer environments enable the operative exploration of sonic events through interaction. The intention of the artist/practitioner may or may not include "emotive" content within operative domains. I maintain, in a pluralistic manner, that a "special sensibility, a structure, a quality of sound, an image of time, an expression of feeling, or a significant form" may also be explored within "operative" environments. There is no one correct way to approach the production and/or reception of music. Psychological spaces can be generated in many different ways (as witnessed in the repetition works of Satie, discussed above). Wilson goes on to elucidate his concept:

The study of music for the relation of part to part and for the interdependence of the part and the whole is irrelevant in a music of distinctly separate parts with many possible correlations. The criterion of unity of wholeness cannot be applied to work which, forgoing organic necessity, gains a feeling of continuing possibility. A music of operations presents not dramatic necessity, but possibilities — some trends, fluctuations and uncertainties, with many live alternatives to what is actually happening. In such open systems, operations combine with operations and there cooperations further combine in loose correlations with a suggestion of endlessness. (Battcock, 1981, p.92)

Such notions of "operational music" become pivotal, in the operative, computer-based system that I have authored because spatial sound relations, associative links and other means of fluid juxtaposition and interrelation are explored within a particular virtual environment exhibiting non-closure.

2.4.7 Propositional Music:

In his paper entitled *Propositional Music: On Emergent Properties in Morphogenesis and the Evolution of Music*, David Rosenboom relates the following ideas:

Propositional Music

The term 'propositional music' refers to a particular style of musical thinking in which the act of composing includes proposing fully developed musical realities — complete cognitive models of music-using propositional musical language accompanied by a propositional language of musical theory. This may also be related to what is called speculative music and speculative theory. It presupposes no extant model of music and no pre-definition of a proper critical stance about music. It does however assume that it is possible to differentiate between creative music makers throughout history and in our present time

period. Such differentiation implies no value judgement or hierarchical categorization according to significance. Rather, it refers to what may be regarded as essentially distinct mind sets that composers have adopted about their activities. A key factor in understanding these mind sets and the musical form that result lies in learning how to look for intelligent order when the form of that intelligence is not known a priori and is, at the outset, undefined and ponderable. (Rosenboom, 1983)

I have spoken in depth about models in the earlier chapter dealing with *Re-embodied Intelligence*. The techno-poetic mechanism potentially seeks to present environments which exemplify the specific mind-set of an author as intermingled with the *users* own interactive approaches to the sonic environment. One could extend Rosenboom's thoughts on "Propositional Music" to what could be called Propositional Media Environments. The techno-poetic mechanism seeks to engender virtual worlds, exploring many forms of media within a dynamic, emergent, recombinant system. I am also interested in the non-hierarchical presentation of media-elements within computer-based systems which are self-organising, drawing from a set of music-historical perspectives. Later Rosenboom states:

Perhaps a musical relativity admitting multiple points of view, frames of reference and operating models is what we require. We must educate the populace to understand that music making can involve creating entire musical universes, each built on its own unique assumptions and provided for inquiring souls to explore. (Rosenboom, 1983)

The techno-poetic mechanism can potentially exemplify this kind of universe, in the expanded media realm of text, image and music/sound elements where the *user*, through navigation, choice and chance methods can potentially derive mutable and multiple "points of view."

2.4.8 Umberto Eco — Returning to the "Open Work"

Umberto Eco, referring to the reading of *Finnegans Wake* by James Joyce (Joyce, 1939), quotes Pousseur talking about new sensibilities in music:

"Since the phenomena are no longer tied to one another by a term-to-term determination, it is up to the listener to place himself deliberately in the midst of an inexhaustible network of relationships and to choose for himself, so to speak, his own modes of approach, his reference points and his scale and to endeavor to use as many dimensions as he possibly can at the same time and thus dynamize, multiply and extend to the utmost degree his perceptual faculties." (Eco, 1989, pp.10-11)

The term "network" will be seen to function in terms of recombinant poetics on a series of different levels of abstraction, where the participant is both within a technological

network as well as functioning in relation to an "inexhaustible network" of potential media. The notions surrounding the personal perspective of the *vuser* has multiple connotations in terms of recombinant works of art. This work seeks to "dynamize, multiply and extend to the utmost degree his perceptual faculties" from inside the realm of virtual space.

In terms of combinatorial works, where sonic artefacts are potentially scattered within and across an operative psychoacoustic space, this "perspective" can be both spatial and conceptual, related both to the relative positioning within a virtual space as well as to the depth of understanding of the listener/user. I have earlier talked about the use of puns, another category of relevant sonic artefacts, dependent on context in terms of determining particular readings. The mechanism that has been created for this project has revealed that each layer of content found within a work related to text, image, or sonic elements becomes a potential shifting field of focus, as it is juxtaposed to other media-elements.

The artist need no longer seek to define a singular artefact, but instead need develop systems that enable a series of sonic artefacts to become operational and poly-combinational, thus engendering an emergent relational sonic artefact during exploration.

2.5 A Selection of Hybrid Technological, Literary and Artistic Works — Toward the Definition of a Field: Recombinant Poetics

In this section I want to point toward a series of works that I have not drawn from to inform the construction of the techno-poetic mechanism. I have chosen, instead, to focus on these works because they could be called recombinant poetic works in their own right. In each of these contemporary works, emergent meaning arises from combinatorial experience in virtual space. I here present a series of related works by different artists, suggesting that recombinant poetics is a field where numerous artist/researchers contribute different research, aesthetics, interface concepts etc.; each is unique but also share a commonality. As earlier stated, art works which explore recombinant poetics are characterised by the interaction of a *vuser* (viewer/user) with a computer-based mechanism that enables that *vuser* to become actively engaged with aspects of generative experience arising from the *combination* and *recombination* of text, image and music/sound elements. The functionality of this mechanism is made operative within an *authored* computer-based *generative* environment. It is the technological functionality of this mechanism that enables direct engagement with digital *media-elements*. These modular variables of text, image and/or music/sound can be observed as *fields* of meaning experienced within a variety of constructed contexts and through processes of interaction.

In terms of the works that I here seek to examine, the conceptual commonality consists in the examination of media-elements in generative virtual spaces, exploring recombinatory strategies to engender emergent experience and concomitant emergent meaning. We must recognise two qualitatively different streams to virtual works: works in which the generative component is based on navigation alone and works which enable a particular construction process as part of a generative methodology. Of the former, Jeffrey Shaw created some very early virtual works that enabled the exploration of that work by a *vuser*, through interaction. Until recently, this early work remained obscure.

In the works that I will site as being recombinant poetic, each has a virtual construction component. I seek to point to the fact that most of these works were created simultaneously — arising from a particular cultural/technological milieu. They did not inform each other, but arose independently within a common cultural, conceptual and technological environment. The fact that these differing works arose in close time proximity is consistent with certain past technological developments including photography and the motion picture, where near simultaneous developments arose

internationally. In particular I am interested in the diverse explorations of the following artists and their exploration of media-elements as generative language-vehicles. There are other art works that have been created during this time that could fit the provisional definition of recombinant poetics, but for the sake of brevity I will focus on these particular works.

The works I wish to discuss as arising in a parallel fashion, considering that each work often takes multiple years of planning, the authoring of specific code, the exploration of a generative methodology and the production of particular media-elements includes the following:

- Jeffrey Shaw's — *Televirtual Chit Chat* (1993)
- Perry Hoberman's — *Barcode Hotel* (1994)
- Knowbotic Research's (in conjunction with Alexander Tuchacek) — *Turing Tuning* (1994)
- Victoria Vesna's — *Bodies Inc.* (1995 - Present)
- Christa Sommerer and Laurent Mignonneau's collaborative work — *A-Volve* (1994 – 1997)

Each of these works is presented within a highly sophisticated, authored generative virtual environment. One of the earliest virtual precursors of this kind of recombinant poetic exploration was by Jeffrey Shaw. Shaw describes his work *Points of View* (1983/1984) as a "theatre of signs," (Abel, 1997, p.102) enabling intricate interaction with a series of simple elements in a 3D space. *Points of View II - Babel* (1983) — a work related to *Points of View* — addressed issues related to the Falklands War and *Points of View III - a Three Dimensional Story* (1984) "explored the notion of an open art work by inviting sixteen people to make narrative contributions which were then interactively linked to the visual scenography so that the viewer could navigate between parallel stories." (Abel, 1997, p102) This system enables the operative exploration of "signs," and linked textual material as a central strategy to its functioning. This early work, enabling the generation of emergent meaning through navigation and interaction, remained unknown to Seaman, until the recent publication of *Jeffrey Shaw - A User's Manual: From Expanded Cinema to Virtual Reality*, (Abel, 1997) published in 1997. This early work did explore the recombination of rudimentary "signs" within a generative 3D space, through the interactive exploration of differing perspectives. A series of art works by Jeffrey Shaw can be seen as containing attributes and functionalities relevant to recombinant poetics. Unlike the works I will next describe, there was no construction component to most of these works. This kind of construction component would have enabled the participant to position the media-elements, as opposed to navigate them. Shaw did make one work which included a generative

functionality, entitled *Televirtual Chit Chat* (1993), enabling the manipulation of networked participants to position and abstract letters from the alphabet as media-elements in a generative virtual space.

The more mature virtual reality works that Shaw has pioneered are still operative through navigation, as opposed to construction processes. Other works by Shaw that can be seen as relevant to recombinant poetic processes are *The Narrative Landscape* (1985/1995), a layered, "topological" (Bolter, 1991, p.25) audio visual work, enabling the *vuser* to move through a series of planar images of landscape tied to narrative elements. This work presents the notion of spatially triggered text within a navigable audio-visual environment. Shaw's *The Legible City* (1988-91) enabled the *vuser* to navigate through virtual space. In Shaw's words, "The viewer is able to ride a stationary bicycle through a simulated representation of a city that is constructed by computer-generated, three dimensional text letters forming words and sentences along the sides of the streets... using the ground plans of actual cities." (Abel, 1997, p126) The relevance of this work is that it presents a spatial, navigable text, re-configurable through the exploration of differing trajectories, as experienced through interaction and navigation. Shaw's *The Virtual Museum* (1991) is relevant in its storage of multiple artistic elements or virtual art works, available for perusal by the viewer.

We could also say that Myron Krueger opened up some of the potentials of the field of virtual Reality. I have outlined his involvement in an earlier chapter.

Significant to the notion of recombinant poetics is Shaw's *Televirtual Chit Chat* (1993). In *Televirtual Chit Chat* Shaw constructed a means for the audience to generate and share text elements in a distributed environment. In many cases Shaw has worked in conjunction with the programmer Gideon May in the facilitation of his works. Gideon May, a leading programmer in the field, has functioned as the programmer for my own techno-poetic mechanism. Whereas Shaw's work is seminal to many individual attributes relevant to my project, the techno-poetic mechanism seeks to integrate and enfold numerous historical foci, conceptual approaches, functionalities and behaviours within a single, generative operative system, as discussed at length above. My techno-poetic mechanism enables construction and manipulation of an environment, as an example of its enfolded functionality, exploring the complex, real time construction of worlds exhibiting emergent meaning. We cannot underestimate Shaw's devotion to research in the field of electronic media, as well as his facilitation of other artists' research, including my own, through the auspices of the Center for Art and Media (the ZKM), in Karlsruhe, Germany.

As suggested above, a series of artists have made contemporary works that are relevant to recombinant poetics. An in-depth analysis of each of these works is outside the scope of this survey. I will here briefly point to a selection of these works. Please see the appendix (Figure 1) for a listing of relevant precursors by Seaman.

Perry Hoberman's *Bar Code Hotel* (1994) is an interesting example of what might be called a recombinant poetic work. Many related functionalities are both common to *Bar Code Hotel* and to my own techno-poetic mechanism, although the premise, interface, content and modes of interactivity are very different. Hoberman enables a room-based distributed viewer interaction through individual bar code elements by mapping the bar codes, which we experience in day-to-day life, onto a different level of functionality within his virtual environment. Each bar code triggers a fragment of functionality in relation to the overall system. Hoberman states:

Bar Code Hotel is an interactive installation for multiple participants (or guests). By covering an entire room with printed bar code symbols, an environment is created in which every surface becomes a responsive membrane, making up an immersive interface that can be used simultaneously by a number of people to control and respond to a projected real-time computer-generated stereoscopic three-dimensional world.

Since any bar code can be scanned at any time, the narrative logic of Bar Code Hotel is strictly dependent on the decisions and whims of its guests. It can be played like a game without rules, or like a musical ensemble. It can seem to be a slow and graceful dance, or a slapstick comedy. And because the activities of Bar Code Hotel are affected both by its changing guests and by the autonomous behaviors of its various objects, the potential exists for the manifestation of a vast number of unpredictable and dynamic scenarios. (Hoberman, 1995)

The significant difference between the work of Hoberman and that of the techno-poetic mechanism created for my project is in the distribution of the interface to many singular inputs in the work of Hoberman versus the singular operative interface in the work of Seaman. Seaman's work can also function in a distributed manner although both participants have direct contact with copies of the entire interface. This fragmented distributed menu of bar codes is particularly successful in terms of its artistic strategy.

Char Davies' work *Osmose*, emergent through navigation and not poetic construction, is relevant in that it seeks to explore particular psychological states within a virtual environment through experiential encounters with image, sound and text. This work would not be considered recombinant poetic because it lacks the generative component. However, *Osmose* is relevant because it seeks to provide a form of meta-experience by enabling the *vuser* to navigate through a visualised section of the code as well as through texts and quotes which function in a meta-manner. The work is also relevant in

that it presents a spatial model of recombination, where an illusionistic set of spaces can be traversed or negotiated through a specific means of navigation. Unlike a linear text, we are interested in observing spatial or "topological" (Bolter, 1991, p.25) experiences that add up or, in other words, become an experience of a set of foci over time. This architectonic approach, explored initially by Shaw, suggests that a series of linked virtual spaces may be holders of content.¹ As the *vuser* navigates and experiences these different virtual localities, an accumulated experience is manifested. This experience is recombinant in that a series of different trajectories can be taken through the environment, although there is a commonalty in terms of the scope of the virtual experience. In a similar manner, an architect may design a building with a fixed set of rooms, halls, etc., and each person may navigate through those rooms based on her/his choice. Depending on what the rooms house, the *vuser* will end up with an accumulated experience of the entire space (or a fraction thereof). A phenomenological accumulation contributes to the evocation of a felt experience.

Knowbotic Research, a team comprised of Yvonne Wilhelm, Alexander Tuchacek and Christian Huebler, with the partners of Westbank Industries and Tactile Technology, as well as the support of Academy for Media Arts in Cologne, has developed many interesting projects. Knowbotic Research's *SMDK — SimulationSpaceMosaic of Mobile Data Sounds* and *tt Turning Turing*, are both examples of what Seaman calls Recombinant Music. It is significant to note the metaphorical language used to discuss their project.

TT Turning Tuning [explores] biological principles and... chance, evolution, memory as discursive concepts of an updated way of producing sounds... aesthetic status-descriptions of a real-time confrontation of machine logic and human intuition. (Knowbotic Research, 1998a)

Technoid Aesthetics: The visitors of KR+cF's environment moves in a communication field in which new forms of language have not yet emerged. The development of a non verbal form of individual knowledge generation draws on an aesthetic experience in various (acoustic, textual, graphical and numerical) encoded public data fields. The information system of *SMDK*, too complex to be fully comprehended, represents a shift in delimiting boundaries of technologically supported, ordered systems. It provides an opportunity to expand our perception and arrive at a critically reflected, technoid-aesthetical experience. (Knowbotic research, 1998b)

In terms of the recombinant metaphor, they are quite clear on its use in the work.

The installed "genome library": the long and narrow strip of metal of the *tt — Turning Tuning* emphasizes the linear arrangement of the microsound genetic sequences (in this case 5 identical sequences in comparison to 2 in the biological DNA structure). It also is a metaphor for the linear logic, but the universality of a Turing machine, whose successive processing forms the basis of this

interactive environment. The mobile video-projector following the metal strip visualizes a time window extracted from the computer-aided sound system. Visual representations of the acoustic phenomena are shaped from the designations given by the sound authors. The copying mechanisms, the temporal and local changes of structure and succession of generations caused by the mutation pressure become visible. *TT-Turning Tuning* is left on its own. The acoustical representations of the system processes become only audible by user interaction. (Knowbotic Research, 1998)

Turning Tuning provides a highly interactive, generative, recombinant environment, falling within the provisional definition of recombinant poetics. Each of the above two works in their own way could be called recombinant poetic.

Victoria Vesna's *Bodies Inc.* (1995 - Present) is an evolving work which is housed on the World Wide Web, but also becomes located and abstracted, in various international galleries. The environment enables the construction of virtual bodies, as well as the exploration of multiple media-elements from differing menus of variables. We navigate and interact with the environment in multiple ways. Vesna describes the environment:

Welcome to Bodies© INCorporated. The building elements at your disposal are ASCII text, simple geometric forms, TEXTures and low resolution sound. Bodies built become your personal property, operating in and circulating through public space, free to be downloaded into your private hard drive/communication system at any time. The MOO/WOO functions as an institution through which your body gets shaped in the process of identity construction that occurs in and mutually implicates, both the symbolic and material realms.

What this site allows you to do:

1)Design a VRML 2.0 based "body" from Male, Female and Infant parts acquired from Viewpoint Datalabs. Each part can be resized and textured by selecting from a group of twelve predesigned images. You can also designate a name, sexuality, age and other attributes.

2)This body is then stored in our database and presented in the "Recent Additions (births) List". The body is also featured for a short period of time in one of our main VRML areas, Showplace, where it sits atop a pedestal for others to admire.

3)A body can be displayed on a member's home page, or used in another VRML world by calling a CGI script:
[http://www.arts.ucsb.edu/cgi-bin/bodiesinc/bodyinline.pl?\(owner's email here\)](http://www.arts.ucsb.edu/cgi-bin/bodiesinc/bodyinline.pl?(owner's email here))

4)Since we only allow one body per email address, you must delete your current body before you can create a new one. After choosing a "method of deletion" for your body, you can build a gravesite for it, made up from textured microchips and resistors. The last twenty gravesites are viewable from another of our main VRML areas, Necropolis. These graves are also accessible from a CGI Script, allowing the owner to display the gravesite of their recently "deleted" on their own home page.

The site is made up of four main VRML areas: Home (the main gathering area from which all else is built), Necropolis (where you may delete your body, or view recently deleted bodies), Showplace (where you may view the latest body additions and the best of the bodies) and Limbo (where nothing is really going on). These spaces will soon become MultiUser and will hopefully provide room for diversity within this community, which is nearing 1000 members. (Vesna, <http://arts.ucsb.edu/bodiesinc/vrml/>)

One can see the relevance of Vesna's work to the emergent field of recombinant poetics in that it fits the above stated criteria. It presents a highly engaging conceptual environment where generative processes can be entertained. Her work is particularly important because it focuses on bodily awareness as it relates to virtual processes and virtual bodies. Vesna's work subtly explores many issues relevant to a contemporary exploration of virtual space. She focuses on issues of virtual ownership, virtual economies and freedom/control. Although her work can be called recombinant poetic, she has a very different approach to that of Seaman. In particular she has focused on the World Wide Web as a venue for her art, enabling access to a vast range of international participants.

Another relevant set of researchers are Christa Sommerer and Laurent Mignonneau. Sommerer and Mignonneau's project *A-Volve* (Sommerer and Mignonneau, 1994-1997) is a work which could be described as recombinant poetic. Although their work explores alive scripting, as a hybrid work, it also enables the dynamic interaction of the *vuser*, by supplying operative media-elements that subsequently behave within the generated environment. Again, the genetic metaphor is highly visible. Sommerer and Mignonneau provide this description of the work:

Abstract:

In the interactive real-time environment "A-Volve" visitors interact with virtual creatures in the space of a water filled glass pool. These virtual creatures are products of evolutionary rules and influenced by human creation and decision.

Designing any kind of shape and profile with their finger on a touch screen, visitors will "bear" virtual three dimensional creatures, that are automatically "alive" and swim in the real water of the pool. The movement and behavior of the virtual creature is decided by its form, how the viewer was designing it on the touch screen.

Behavior in space is, so to speak, an expression of form. Form is an expression of adaptation to the environment.

Form and movement are closely connected, the creatures capability to move will decide its fitness in the pool. The fittest creature will survive longest and will be able to mate and reproduce. The creatures will compete by trying to get as much energy as possible. Thus, predator creatures will hunt for prey creatures, trying to kill them.

The creatures also interact with the visitors, by reacting to their hands movement in the water. If a visitor tries to catch a creature, it will try to flee or stays still, if it gets caught. Thus the visitor is able to influence the evolution by for example protection preys against predators. If two strong creatures meet, they can create an offspring and a new creature can be born. It carries the genetic code of its parents. Mutation and cross-over provides a nature-like reproduction mechanism, that follows the genetic rules of Mendel. This newly born offspring will now also react and live in the pool, interacting with visitors and other creatures.

Algorithms, developed by Mignonneau and Sommerer ensure smooth and natural movements and "animal-like" behavior of the creatures. None of the creatures are pre calculated, they are all born exclusively in real time through the interaction of the visitors and the interaction of the creatures. Thus, an unlimited variety of forms will be possible, representing human and evolutionary rules. By closely connecting the real natural space of the water to the unreal virtual living space of the creatures, "A-Volve" minimizes the borders between "real" and "unreal", creating a further step (after "Interactive Plant Growing") in the search of "Natural Interfaces" and "Real-Time Interaction."

INTENTION and CONCLUSION

"A-Volve" is a pool of artificially living creatures, that are open to outside influences by reacting and interacting with their "natural" and "artificial" environment.

"A-Volve" reduces the borders between real and unreal, by connecting reality to "non-reality." Human decision in the creation of a new form and the rules of evolution and selection will create an environment that is open to all possible modifications and selections, following the laws of evolution and creation. The visitor becomes part of the evolutionary system, he is a partner of the virtual organisms and gives and promotes their "artificial life."

Water as the metaphor for birth and basic evolution is the medium for this artificial life "pool," that is open to its real environment.

A-Volve (c) 1994-1997, Christa Sommerer and Laurent Mignonneau
(Sommerer and Mignonneau,

<http://www.mic.atr.co.jp/~christa/WORKS/CONCEPTS/A-VolveConcept.html>)

A-volve exhibits the above stated criteria, although extending that criteria through artificial life processes. I have earlier spoken above about different varieties of emergence. *A-volve* is significant because it represents a conflating of the two different approaches to emergence that I have earlier discussed — emergence through A-life programming and emergence through generative recombinant poetics. This is achieved through the exploration of simple, interactively drawn media-elements that combine, become operative, and exhibit emergent meaning within the computer-based environment.

Each of these recombinant poetic works enable emergent properties to be explored by an interacting participant. Each recombinant poetic work:

- empowers a very high level of interactive engagement;
- defines its own individual approach to art content;
- involves media-construction as an active emergent process in the work, exploring different varieties of media-elements;
- is unfolded within a generative virtual environment.

The primary difference that separates my own techno-poetic mechanism from the works here cited is the fact that *The World Generator*/*The Engine of Desire* has sought to examine emergent meaning as its central exploration. Emergent experience and concomitant emergent meaning, is an evocative product of each of these works. In this light I would suggest that recombinant poetics can be seen as its own field or discipline, in which different practitioners each make their own relevant contribution.

In the following chapter I will sum up the transdisciplinary research that I have undertaken to inform the construction of the techno-poetic mechanism. I will seek to elucidate the concepts and perspectives that have been provided through this linked written narrative, to enframe this interactive, generative virtual environment.

1 See the description of "Place Holder" in *Immersed In Technology* (Moser, 1996)

3.0 The Enfolding of Approaches

We could say that a recombinant poetic methodology informs the construction of this narrative, the authorship of the techno-poetic mechanism, and construction of media-worlds through that mechanism. In each case a series of diverse elements are brought together to make an emergent meaning assemblage. In each case, a spatial collage of functionalities is rendered operative: in the "volume" of code that has been written by Gideon May to make this project functional, in this textual "volume" (Derrida, 1978, p.25) elucidating this project and in the complex virtual volumes that are generated through the techno-poetic mechanism.

3.1 A Conflation of Language-Vehicles — Image, Music/Sound and Text

I will here sum up the salient approaches to emergent meaning that have been examined up to this point.

Poetic meaning as explored by an artist has been a continuing focus. An open contemporary definition of poetics as exemplified through a new form of technological/poetic production has been provided. Multiple perspectives on the nature of the "sign" have been elucidated. The fact that meaning arises within particular contexts has been explored. From Peirce, the following definition has proven to be pivotal: meaning is that which the sign or signs "convey" (Peirce, 1931, p.171) to an observer of a particular context. Peirce's concept stating that "A sign [or representation] stands *for* something *to* the idea which it produces, or modifies. Or, it is a vehicle conveying into the mind something from without," (Peirce, 1931, p.171) is also of critical importance to my argument, because the generative virtual environment can also be seen as an ongoing space of sign "modification."

Eco's concepts of "The Open Work" and "Works in Motion" (Eco, 1989) have been presented; they suggest new functions for the work of art and new active roles for the observer of that work. The term "*vuser*" has been established [coined by Seaman]; it combines the term user and viewer and points toward interactive contexts where meanings are generated through dynamic interaction within a particular self-organising computer-based system. Interaction within a specific generative virtual environment has remained central to the research.

The techno-poetic environment enables the exploration of computer based media-elements of text (both spoken and written); images (both still and time-based); images, both 2D and 3D; and an exploration of music and/or spoken text. We could say that all of these media-elements function as vehicles "conveying into the mind something from without," (Peirce, 1931, p.171) which again accesses Peirce's definition of the sign.

I have coined the term recombinant poetics as a means of describing an emergent field that seeks to entertain the interactive exploration and inter-conveyance of media-elements within mutable, operative, generative, combinatorial, virtual environments.

One perspective I have posited suggests that each of these media-elements potentially functions as a *language-vehicle*. I have focused on a non-logocentric approach to language through the mixed-semiotic virtual-spatial environment of the techno-poetic mechanism. This perspective grows out of Derrida's concept of proto-writing and the extended definition of linguistics as presented by Maturana. A series of perspectives related to this extended notion of language has been elucidated, suggesting the need for the development of a theory related to computer-based environmental engagement with emergent meaning.

I have juxtaposed this emergent theory of proto-writing with the ideas of Deleuze and Guattari, where they infer that virtual space is not comprised of language-vehicles, but is a mixed-semiotic "machinic assemblage" — meaningful, but not as language. The difference between these two perspectives can not be resolved. The notion of fields of meaning, seems to provide a pivotal overlap in understanding each of these differing perspectives. The concept of fields of meaning has been articulated, one that explores how meanings can arise through the juxtaposition and interpenetration of media-elements. One focus has been the unfixity of meaning as it is produced within continuously mutable and/or shifting computer-based contexts through interactive explorations with the recombinant sign.

A series of processes has been presented — a series which potentially lead to the generation of emergent meaning. This generation was accomplished by augmenting the mutability of context through operational relations that juxtapose, alter and/or abstract media-elements. These processes, as explored within my authored generative virtual environment, include: construction processes; navigation processes; processes exploring authored media-behaviours; editing processes; virtual environmental placement processes; aesthetic abstraction processes; automated generating processes; processes related to distributed virtual reality; and semi-random computer-based chance processes.

The term cyber-polysemic space has been coined by Seaman as a description of the complex media-space that we encounter within the techno-poetic mechanism.

All of the above examinations have been developed to explore the nature of context, decontextualisation and recontextualisation, within a experiential environment, as a particular mechanism to generate emergent experience and thus, emergent meaning. I have spoken at length about the process of inter-authorship. I have presented a working description of my generative virtual environment - *The World Generator/The Engine of Desire* to elucidate this operative mechanism. This art work enfolds the above approaches, within an operative, generative virtual environment. It has been shown that this environment becomes meta-operative through mindfully aware operation. (Varela, Thompson, and Rosche, 1991, p.22)

The menu system of spinning container-wheels functions as a context, initially housing the media-elements. Evocative worlds have been articulated, each exhibiting varying levels of abstraction, produced through this techno-poetic mechanism. A series of perspectives on emergent meaning has been presented, as they are encountered through computer-based environmental relations, both textually in this dissertation and pragmatically within the generative virtual environment. This art work has been facilitated through the employment of a new kind of menu system, as well as through a hardware interface that is physically linked to the software environment. The notion that the techno-poetic mechanism could produce highly abstract worlds has been explored.

The nature of variable juxtaposition has been discussed, particularly as it contributes to the observation and production of emergent meaning brought about through new methodologies of spatial collage/montage. The complexity that characterises this environment enables the exploration of the following notion: the dissolution of meaning could potentially function as one evocative state of meaning explored through the techno-poetic mechanism. This state of dissolution can be observed in relation to particular Dada and Surrealist word/image works (Welshman, 1989, p.45), suggesting that this dissolution actually presents an environment of heightened engagement with meaning processes.

The relevance of Wittgenstein's concept of "the meaning of the word is its use in language" (Wittgenstein, 1958, p.20) has been articulated. In particular, I have explored how my project differs from his in respect to this statement.

Concepts from Deleuze and Guattari have been presented that are relevant to my project. These include the notion of the "Rhizome" (Deleuze and Guattari, 1987, p.21), the "Body Without Organs" (Deleuze and Guattari, 1987, p.153), "Desiring Machines" and the "Machinic Assemblage" (Deleuze and Guattari, 1987, pp. 144 –146) as well as the concept of "Smooth and Striated space" (Deleuze and Guattari, 1987, p.474) as developed in *A Thousand Plateaus* (Deleuze and Guattari, 1987) and *Anti-Oedipus* (Deleuze and Guattari, 1983). More specifically, I have pointed out how my techno-poetic mechanism can be understood as an operational "machinic assemblage" (Deleuze and Guattari, 1987, pp. 144 –146), one that enables the examination of emergent meaning in a diagrammatic, operational manner.

The usefulness of Pragmatics as an approach or perspective on generative mechanisms of meaning has been defined. In particular, the techno-poetic mechanism can be viewed as an operational approach to the enabling of a specific pragmatic methodology articulated by Deleuze and Guattari. The value of my project to their varying and extensive research, is in extending their concepts into the experiential/technological realm.

The relevance of concepts of Collage, Montage and Bricolage (Ulmer, 1983, p.84) to the project has been explored, as well as the notion of "Post Criticism" (Ulmer, 1983, p.83) articulated by Greg Ulmer, where collage related, artistic/poetic approaches to discourse are suggested. In particular, my work can be seen as a particular generative virtual example of *Applied Grammarology* (Ulmer, 1985) as developed from Derrida's *Of Grammarology* (Derrida, 1977), that is exemplified in a computer-based environment. One could say that I have created an *Applied Grammarological Machine* for the exploration of emergent meaning. Derrida's concept of "différance" (Derrida, 1976, p.23) is applied. Repeatability and difference [différance] have been examined as they are explored within the techno-poetic environment, seeking to articulate the nature of experience in this space.

The relevance of Kristeva's concept of intertextuality (Kristeva, 1984, p.60) to the project has been examined. The techno-poetic mechanism can be seen as a mechanism to promote mixed-semiotic intertextuality.

The importance of pointed-nonsense has been shown, by defining a new concept: *Nonsense Logic*.

The fact that the techno-poetic mechanism embraces paradox has been elucidated. Issues surrounding the nature of the recombinant sign have been articulated. The

importance of the recombinant sign's employment, engendering emergent experience and, in turn, emergent meaning has been explored. Issues surrounding potentiality have been covered. Chance and probability have been examined as they dynamically relate to the exploration of emergent meaning. The significance of games and play has been discussed. The importance of puns has been shown as pivotal to the generation of emergent meaning. In particular, the notion that the mechanism embodies a *pun on symbolic logic* has been brought forth.

A dynamic series of observations made from the above surveys have informed the construction of the generative virtual environment. I have examined the work of many artists, composers, writers, technologists, scientists and philosophers, to help inform the authorship of the techno-poetic mechanism in terms of particular conceptual strategies. These strategies have been abstracted and functionally enfolded within the techno-poetic mechanism. Through these various approaches, I have informed the development of this generative virtual environment, now tested, honed and fully operational.

I have sought to develop a unified approach: to address technological, artistic and philosophical concerns. We can say that a paradigm is emerging, bringing these divergent investigations into an enfolded field of fields. Informed by the above research, I have sought to facilitate the following: To make the prototype functional as a specific techno-poetic mechanism through the generation of computer code in conjunction with the programmer Gideon May; to generate a relevant set of media-elements of image, music/sound and text, which are rendered operative and mutable within the mechanism; to present a mechanism that empowers *vusers* to make specific combinations and recombinations of constructed (authored) elements, interactively; to enable interactivity with intuitive ease; to enable the *vuser* of this mechanism to make other functional choices from an operative menu system including the generation of environments with particular "semi-random" characteristics; to enable the *vuser* to navigate within the derived 3D space; to enable the user to attach differing spatial behaviours to objects, images, texts, music and spoken text; to enable the *vuser* to explore elaborate pre-defined media abstraction processes; to present a particular set of artistic relations, enabling the exploration of specific problematics relevant to the project in terms of aesthetics. In all, to enable the exploration of emergent meaning in an experiential manner.

It must be noted that this mechanism has been intentionally *geared* for artistic application although the potentials of the mechanism for other storage, construction and

navigation purposes as well as for the exploration of other potential processes will be discussed in the section entitled "Future Research" at the end of the dissertation.

I have undertaken a set of transdisciplinary surveys. I have developed my concept of the conceptual machine, tracing its roots in terms of computer-based environments to both Lovelace's comments on the Analytical Engine as well as to Turing's concept of the Universal Machine.

As stated above, a conceptual machine can be defined as a machine that functions through text and in some cases through images. This machine seeks to be an active agent functioning within a generative process. Computer code, in the techno-poetic mechanism, functions as a specifically authored, operational, conceptual machine, enabling operations to be made on particular media-elements.

I have examined notions of the cut-up techniques as a methodology for the structuring of a work of art. By making these cut-up processes operational, the potential for generating changing or alternate contexts, is actuated. By actuating these processes in a spatial computer-based environment, a series of different potential interrelations between media-elements is articulated. In particular I have sought to re-understand the concepts of montage as articulated by Eisenstein, in terms of a virtual/spatial exploration of juxtaposition and meaning-force. (Eisenstein, 1949, p.37)

The *vuser* entertains relations between a series of media-elements by potentially bringing them into proximity. The media-elements function in a field-like manner, co-mingling within the computer-based environment. This generated media-element configuration thus defines a mutable context. The inter-penetration and spatial relativity of the media-elements is perceived by the *vuser*. A reciprocal relation between the *vuser* and the environment is brought about through an operational conceptual machine — computer code. The specific authorship of this code enables particular forms of functionality within the environment.

The *vuser* potentially becomes mindfully aware of these processes and observes her/his own dynamic relation with the techno-poetic mechanism as a meta-operational process. The *vuser* experiences a form of environmental summing of perceptions of the fields, in an on-going examination of active meaning forces.

The environment functions as an operational diagram of its own functionality. The *vuser* becomes dynamically involved with different processes in the environment by both experiencing and generating emergent meaning. The underlying computer-code

functions in a transparent manner, enabling these processes to continue in a self-organising, organism-like manner. The media-elements, by potentially populating the environment, have particular qualities that have been authored. These qualities have also been informed by the above surveys. The authoring of multivalent entities, exhibiting content condensation, is one particular strategy. This condensation can be seen as related to Freud's concepts of the Dream-content and Dream-thoughts, where the constructed virtual environment is dream-like in nature. Dream(like)-thoughts are potentially explored when the condensed material is unfolded and entertained through associations triggered during and after interaction. (Freud, 1965, p.313) A conceptual economy of means is thus authored.

The techno-poetic mechanism enables the conflation of a vast collection of language-vehicles — enfolding the differing mileus of the language of images, the language of music and textual language. This media-collection is not a logocentric vocabulary. This media-element collection presents a range of language-vehicles, derived from multiple semiotic systems, thus enabling the formation of mixed-semiotic configurations. Where Derrida might see this as a form of proto-writing, I believe the term "writing" will always bring us back to the logocentric. The word "conveyance," is more appropriate to this project, because a conveyance needs only to register a meaning force in the mind of the *vuser*. This conveyance does not need to function in a logocentric manner in order to provide meaning to the participant. The techno-poetic mechanism facilitates a layering of fields of meaning force potential, drawing from the provided media-collection, where each media-element exhibits its own qualities of meaning force within the generative virtual environment. Emergent meaning is generated as a product of differing interaction with this media-collection within the generative virtual environment. Thus, my mechanism seeks to explore a mixed-semiotic recombinant poetics.

4.0 **A Specific Techno-Poetic Mechanism** **Exploring Emergent Meaning:** ***The World Generator/The Engine of*** ***Desire***

I have sought in this dissertation to answer the following question: could an artist produce a generative virtual environment where emergent meaning could be examined and explored through interaction within that environment? I have undertaken transdisciplinary research as articulated above in order to inform the authorship of this device. I will here define the functionality that has been authored into the device through the programming assistance of Gideon May. I will in each case define how this aspect, made operative within the techno-poetic mechanism contributes to an exploration and/or examination of emergent meaning.

The World Generator/The Engine of Desire is an interactive computer-based generative virtual environment that enables *vusers* to construct and navigate poetic worlds in real time. The system is facilitated through a new interface metaphor. At the bottom of the screen is a rotating set of virtual container-wheels. These container-wheels house a variety of selections. I will here present a breakdown of the operative functions that are housed on the wheels as well as describe the related hardware interface that has been created to function in seamless co-operation with the software.

The menu system is a context. This context is revealed through the spinning of a set of virtual container-wheels. As this media collection is observed, a particular set of meanings are conveyed. A *vuser* may not necessarily start in this *particular* context.

The Functionality of the Device:

Spaceball:

A physical spaceball is presented on the interface-table.¹ The *vuser* explores the possibilities of *The World Generator/The Engine of Desire* by navigating in the world with the spaceball. By shifting the positioning of the spaceball with her/his hand, the participant can move left, right, backward, forward, as well as look up and down within the virtual space presented in front of them on a projection screen.² Emergent meaning is revealed in part based on the virtual perspective of the *vuser* as well as their time based movement through a derived constellation of media-elements.

Menu button:

A special menu button is built into the interface-table. The *vuser* can call up the virtual menu of container-wheels with the menu button on the interface table. The menu button puts the virtual menu on the screen, blows up the menu for a detailed look at media-elements and toggles the container-wheel menu off. One can move back and forth between the context of the container-wheels to the environment that is generated. Emergent meaning arises out of the difference [différance] (Derrida, 1976, p.23) between these two contexts; the menu system, housing the media-elements, as juxtaposed to the configuration of media-elements that is constructed on the plateau.

Trackball:

A physical trackball is built into the interface-table. The trackball rotates the menu wheels, navigates across the container-wheels and highlights particular media choices. The *vuser* can make a menu choice by pressing the "select" button, once a cubicle has been highlighted by a blue rectangle. This selection function also enables us to preview each spoken version of the short poetic texts included in the menu. This function also enables one to preview the individual music loops which are housed within the system. We can also take a close look at particular media-variables. The trackball is central in establishing a particular meaning context that can be disrupted through re-placement of the media-element on the *Plateau* space.

Select Button:

The select button enables us to make any selection available on the virtual container-wheels. The select button engages a new form of Eisensteinian spatial montage. When a choice is made, a dynamic spatial juxtaposition or media-process is brought about on the Plateau. This could also be considered a means of generating a dynamic form of spatial collage.

Aura Button:

A small black button on the spaceball, toggles an "aura"³ on and off, on the media-object just in front of whatever virtual position the *vuser* has assumed in the environment. This aura is a selection tool and tells the *vuser* what media-object can potentially be acted upon or manipulated⁴. Potential manipulations that can be performed on *selected* media-elements have been described in the section entitled *Salient Processes*. Each different process brings about a change in the appearance and presents a potential for generating emergent meaning. Editing can include the following: attaching a texture map, attaching a moving texture map, changing a texture map, changing a moving texture map, attaching a musical loop to the media-element, scaling the media element, altering the transparency of the media-element, altering the behaviour of the media-element and deleting a media-element.

Function Wheels:

A series of semi-random functions can be selected. Each of these functions also contribute to a change in the environment and contribute to the potential of generating emergent meaning. The participant can select from the "Random" function wheel, one of the following processes:

Random Functions:

Random World:

This function enables the instantaneous building of a still (non-moving) virtual world that includes a selection of a series of media-objects, texture maps to cover those objects, sounds to be attached to those objects and texts to be positioned in the space. Here is one example of *re-embodied intelligence* (see earlier chapter) where the computer builds a semi-random world functioning as an extension of the mind-set of Seaman. The media constellation that is generated posits a series of dynamic juxtapositions and potentially generates emergent meaning. Although the wheel is marked "random," there is a high level of programming to bring this selection about. This programming functions as a *conceptual machine*. All of the random functions happen within particular ranges to heighten the potential of the construction of an aesthetic environment. This is a kind of "loading of the dice," or "canned chance" as explored by Duchamp in his work, *Three Standard Stoppages* (1913-1914).

Random Behaviours:

This function attaches a random behaviour to each object within the world. Very fast dynamic changes can be obtained by making this selection over and over again in rapid succession. These changes again represent a form of Einsteinian spatial montage and potentially generate emergent meaning. The behaviour of the differing media-elements is altered in a (filmic) cut-like manner through this selection.

Random Object:

This function makes a selection of a random media-object and places it in the plateau space. Any change in the environment presents new spatial juxtapositions and can contribute to new conveyances of meaning.

Random Sound:

This function makes a selection of a random musical loop from those presented on the container-wheels and places it the plateau space before the *vuser*. Any additional sonic

juxtaposition can also change the experience of the environment and contribute to the production of emergent meaning.

Random Text:

This function makes a selection of a random text from those presented on the container-wheels and places it the plateau space before the *vuser*. Any text, as selected from the menu system, can contribute to the altered understanding of the environment and, in turn, present the potential of generating emergent meaning.

Random Behaviour:

This function chooses a random behaviour from those presented on the container-wheels for a single, "selected" media-object; if no object is selected with the aura, then this function also automatically selects a random object and attaches a random behaviour, again potentially contributing to an altered understanding of the evocative nature of the environment.

Random Still:

This function makes a selection of a random still and places it in the plateau space. Any change in the environment, presenting new spatial juxtapositions and can contribute to new conveyances of meaning.

Random Movie:

This function makes a selection of a random movie from those presented on the container-wheels and places it the plateau space before the *vuser*. As earlier stated, any juxtaposition can contribute to the production of emergent meaning. If an object is selected, a movie will be mapped onto that object. If no object is selected, then the movie will play on a virtual screen.

Random All:

This function builds a virtual world in real time using all of the following variables: texts, objects, behaviours, sound-objects/musical loops, stills and movies. The machine places the media-objects randomly within particular distance ranges. It represents another example of *re-embodied intelligence* (see earlier chapter). If the *vuser* presses the "menu" and the "select" buttons simultaneously, she/he sets the *random all* function into action, building a virtual world in real time. This process also sets into motion the possibility of producing emergent meaning through generated juxtapositions.

Texture Map Container-Wheels:

Texture Map:

The *vuser* can attach a specific texture map (still image) to a selected object: The participant selects an object by moving close to it — surrounding it with the aura. The *vuser* then selects a still image from the container wheels to be wrapped around the chosen object. When this is done, a spatial conflation of still image and virtual object is facilitated. This process can be equated to projecting a slide onto a object, although it has some differing spatial properties, unique to digital space. A still image can also be placed into the environment as a flat screen, not attached as a texture map. When no object is selected with the aura and one chooses a still image, the image enters the environment as a flat picture. Again, the juxtaposition of a particular still image or the texture mapping of this still, can potentially contribute to the production of emergent meaning.

Movie Loop Container-Wheel:

Moving Texture Map or Digital Movie — The *vuser* can attach a moving texture map or digital movie (moving image) to the object. The participant selects an object by moving close to it and surrounding it with the aura. The *vuser* then selects a movie image from the container wheels to be wrapped around the chosen object. When this is done, a spatial conflation of moving image and virtual object is facilitated. The look of a texture-mapped movie can be related to projecting a movie image onto an object although it has some differing spatial properties. A movie can be placed into the environment as a flat screen, not attached as a texture map. When no object is selected with the aura and one chooses a moving image, it enters the environment as a flat virtual movie screen. The juxtaposition of this movie with other media-elements, as well as the texture mapping of this movie onto particular media-elements potentially contributes to the generation of emergent meaning within the environment.

Sound-Object Container-Wheel:

Sound-Object — The *vuser* can attach a specific musical loop to a media-object. The participant selects an object by moving close to it and surrounding it with the aura. The *vuser* can then choose a particular sound-object/musical loop by moving to the last container-wheel, rehearsing the particular audio loop and then selecting it by pressing the physical select button. A music loop can also be put anywhere in the space on it's own, by just selecting it without an initial object being chosen. An environment comprised only of musical loops can also be generated. We can observe the position of sound objects that are not attached to particular virtual objects by selecting "show sound" from the system Container-Wheel. When this is selected, one sees a "drop motif" where each hidden sound is. We can toggle this off by selecting "hide sound" from the Container Wheel menu. The positioning of these sound objects can contribute

to different conveyances of the environment and potentially contributes to the generation of emergent meaning.

Behaviour Container-Wheel:

The participant can attach a specific behaviour to a media-object when it has been highlighted with the aura. This process includes 3D objects, picture stills, movies on flat screens, texts and sound-objects. The following behaviours are available from the Behaviour menu (presented on the menu as icons): spin on axis, spin "head over heels," oscillate up and down, spiral out and in, change scale by getting bigger and smaller, circle, stretch in height, move in a line back and forth. Any behavioural choice will potentially alter the experience of the environment and can potentially contribute to the production of emergent meaning.

Function Container-wheel:

The "function wheel" is the far left wheel. This wheel enables the *vuser* to *Clear* the world for a fresh start; *Center* — centers the *vuser* in the "World" if lost; *Trans+ / Trans-* — makes media-elements more transparent or more opaque if already transparent. "Show Sound" enables the *vuser* to observe where sounds are positioned in space through a "drop motif." "Hide Sound," hides this "drop motif." The scale selection icon scales objects up or down in size. Each of these choices presents the potential for altering the experience of the environment and in turn producing emergent meaning.

The collection of media-elements carries specific artistic content or fields of potential meaning. After generating a world, the *vuser* can then enter into the world constructed from their selections and navigate as well as manipulate the chosen variables within 3D space. This suggests a new virtual-spatial cinematic form. At present only one video texture map plays at a time (based on *vuser* proximity). When the *vuser* moves away from the video, the selection becomes a still. As the *vuser* approaches another, it becomes active. Navigation also presents differing perspectives or spatial juxtapositions of media-elements and can potentially contribute to the production of emergent meaning.

When the system is restarted or when the *vuser* makes the selection of *clear world*, the data projector displays an empty "World" which can then be added to, from the construction menu (the container-wheels) at the bottom of the screen. Objects which are selected from the construction menu are instantly entered into the virtual world or Plateau space in real time, directly in front of the *vuser*. As earlier stated, a transparent "aura" defines the activated object (the object the *vuser* can manipulate/edit). The *vuser* can toggle the "aura" on and off from the small black button on the space ball. The

vuser can also move close to an object and select it by toggling on the aura with this black button. They can then act upon their choice. The *vuser* is able to control the rotation of the menu wheels, moving them forward or backward, as well as position the blue "selection" square, accessing many choices with great ease. Although I have presented these variables through description above, the *vuser*, once acclimated to the system, can intuitively construct new spaces.

Each of these rotating menus has a particular aesthetic. Thus, the set of rotating menu wheels becomes a rotating icon series or set. A specific number of elements (depending on the quality of the computer) are allowed in the space at one time. An upper number of media-elements is set in the program. When additional objects are entered into the Plateau space, earlier objects disappear in the order that they have been entered into the space.

Process:

The work functions in an ongoing multi-stage process: The *vuser* can construct a "poetic" environment based on selections from the template of media-variables. A subset of that mode enables the *vuser* to observe a blow-up of the menu. The set of container-wheels presenting the above variables, rotates and the *vuser* can choose objects from the main menu. The actual storage is in the form of long "virtual" rotating belts which can have great length (based on available memory) although the viewer only sees the curved front end of the belt.

An elaborate object-based text is included in *The World Generator/The Engine of Desire* [see appendix and/or CD-ROM]. A *vuser* can choose many lines from the text, one at a time and place them in the space as a visual object with a "location sensitive" audio-text triggering mechanism. I have entered my voice speaking each line of text. As the *vuser* moves close to the 3D text he/she hears the line spoken. Thus, a new sonic spatial literary form is developed. Texture maps and behaviours can also be applied to these text objects.

Recombinant Music:

The sound-objects or music loops included in the system are made up of hundreds of techno-ambient selections, composed by Seaman, consisting of synthetic rhythms, drones and tonal loops. Specific tonal sax loops have been played by Tony Wheeler. As the *vuser* navigates, a location-sensitive audio mix is generated. As one moves close to a sound object the volume goes up; as one moves away the volume goes down; as the *vuser* navigates by an object on the left — the sound comes from the left; if a *vuser* navigates by a sound on the right, the sound comes from the right; an object in front of

the *vuser* sends sound equally to the left and right, making a stereo mix. A behaviour can be attributed to a sound object. A sound object can also be attached to a 3D object. These music loops have been created with the notion that permutations of these elements would be facilitated within the computer-based generative virtual environment. Permutation generates difference [différance] (Derrida, 1976, p.23) and contributes to the production of emergent meaning.

Once the sound has been positioned it functions in a "location sensitive manner" to the *vuser*. It is as if the sound is emanating from a specific position in the computer-based space. As the *vuser* navigates, a live sound-mix is created. An "emergent" musical composition constructed through the navigation of the *vuser*, moves in relation to differing sound proximities of its construction. This varying musical configuration can also be constructed through chance methods, with the selection of particular menu choices. This series of volume "responsive" musical and sonic elements make up a "recombinant" musical/textual environment based on the interactive positioning of the sound object and visual texts as well as the virtual proximity of the *vuser* navigating within this space.

Thus, an elaborate techno-poetic mechanism has been authored producing emergent experience and, in turn, generating emergent meaning.

1 Note: the construction of the menu table was facilitated in conjunction with the ZKM in Karlsruhe, Germany, which is directed by Jeffrey Shaw.

2 This space is not an immersive virtual space where one wears eye-phones, although the width of the screen, the darkness of the environment, the resolution of the image and the palpable feedback of virtual movement, make the environment feel quite immersive.

3 See Walter Benjamin, "The Work Of Art In the Age of Mechanical Reproduction" in *Illuminations* (Benjamin, 1973) for a particular historical perspective on the notion of the aura in electronic works of art.

4 This aura enables "World Processing," a term coined by Erkki Huhtamo describing processes exhibited in the techno-poetic mechanism. See Huhtamo, 1997.

5.0 Analysis of the Mechanism — *The World Generator/The Engine of Desire* — A Meta-Machinic Assemblage

There is a multiplicity of perspectives that informs the observation of the media-elements in terms of the production of emergent meaning within my art work *The World Generator/The Engine of Desire*. These can be divided into two major differing perspectives. The techno-poetic mechanism can be seen as a new form of expanded language exploration, seeing each media-element as a potential language-vehicle. This perspective is based on the concepts of Derrida, on the definition of linguistics proposed by Maturana, and on the expanded understanding of the sign provided by Peirce. It proposes a new form of non-logocentric computer-based proto-writing. The generative virtual environment can also be understood from an alternate juxtaposing perspective. It can be seen as a mixed-semiotic space which is not language, as articulated by Deleuze and Guattari. This mixed-semiotic space again produces meaning. Meaning can arise through either perspective. I have used the notion of *fields of meaning* to function as a pivotal bridge between these two perspectives. A language-vehicle can be seen as a potential *field of meaning* from one perspective. A semiotic media-element can also be seen as a field of meaning from the alternate perspective. Emergent meaning arises through the alternate configuration of these media-elements within the techno-poetic mechanism.

I have sought to find ways to elucidate this art practice. As stated in the introduction, Pragmatics forms one perspective of observation that has informed both the construction and elucidation of the techno-poetic mechanism. Deleuze and Guattari state: "If the external pragmatics of non-linguistic factors must be taken into consideration, it is because linguistics itself is inseparable from an internal pragmatics involving its own factors." (Deleuze and Guattari, 1987, p.91) In *A Thousand Plateaus*, Deleuze and Guattari posit a contemporary approach to "pragmatics:"

Pragmatics as a whole would consist in this: making a tracing of the mixed semiotics, under the generative component; making a transformation map of the regimes with their possibilities for translation and creation, for budding along the lines of the tracings; making the diagram of the abstract machines that are in play in each case, either as potentialities or as effective emergencies; outlining the program of the assemblages that distribute everything and bring a circulation of movement with alternatives, jumps and mutations. (Deleuze and Guattari, 1987, p.147)

I will here focus on "outlining the program of the assemblages that distribute everything and bring a circulation of movement with alternatives, jumps and mutations." The

techno-poetic mechanism is an operative "machinic assemblage" (Deleuze and Guattari, 1987, p.145) that functions through the conceptual machine of computer code, within a specific computer-based hardware environment. This environment functions as a specific contemporary example of the "Universal Machine" (Hodges, 1983, p.104) concept of Turing. I have authored a dynamic, self-organising system¹ (McCorduck, 1979, pp.82-83) (Ashby, 1952) that enables a complex interactive exchange between a *vuser* and a computer-based system. The system functions as an agent of the initial author, facilitating both the functionality of the system as well as enabling the existence of the collection of media-elements and media-processes that make up that system. This interaction empowers a form of inter-authorship. The *vuser*, as one central vehicle of interaction, deterritorialises media-elements from the constructed context of the menu system.

I have made the techno-poetic art work a machine that enables controlled as well as triggered semi-random deterritorialisation and subsequent re-territorialisation of media-elements.

The security, tranquillity and homeostatic equilibrium of the strata are thus never completely guaranteed: to regain a plane of consistency that inserts into itself the most diverse systems of stratification and jumps from one to the other, it suffices to prolong the lines of flight working the strata, to connect the dots, to conjugate the processes of deterritorialization. We have seen that signification and interpretation, consciousness and passion, can prolong themselves following these lines and at the same time open out onto a properly diagrammatic experience. All of these states or modes of the abstract machine coexist in what we call the machinic assemblage. (Deleuze and Guattari, 1987, pp.144-145)

The *vuser* of the techno-poetic mechanism takes an active role through interaction with the system. With intention and/or through play, the *vuser* potentially defines a spatial configuration of media-elements. This new form of collage/montage, as articulated in a virtual spatial environment, is conjugated within the thought processes of the *vuser* — it is not built of chains of signifiers, but of trajectories or flows through generative, evocative computer-based volumes. This virtual world is to different extents, evocative. As Peirce articulates: "A sign [or representation] stands *for* something *to* the idea which it produces, or modifies. Or, it is a vehicle conveying into the mind something from without." (Peirce, 1931, p.171) The media-constellation presents a spatial grouping of signs, each exhibiting its own summed meaning-force, as perceived by a particular *vuser*. The experiential nature of the environment takes it beyond logocentric conjugation and explores a realm of dynamic media-element juxtaposition and interpenetration. Because the media-elements have been authored, they present a probability of conveyance. This conveyance is actuated and shifted in a relative manner, in terms of the juxtaposition and interpenetration brought about by an active participant.

The *vuser* is driven by her/his own desires and choices, to construct a virtual environment, within this play-like space. As they examine the "diagrammatic" output of the computer-based system, as presented before them, on the data-projection screen, they are witnesses to their own choices. The environment can be seen as a *meta-machinic assemblage*. (Deleuze and Guattari, 1987, pp.144-145) The *vuser* can potentially function in a mindfully-aware manner (Varela, Thompson and Rosche, 1991, p.22) within this constructed environment, becoming self-observant. The experience is "diagrammatic" of itself. As a virtual construction, it is a diagram of the choices and processes that have been chosen by the *vuser*. It is a merging of a literal machinic assemblage as propagated by the computer, computer code and *vuser* interaction, with Deleuze and Guattari's conceptual "machinic assemblage" (Deleuze and Guattari, 1987, pp.144-145) brought about through the "abstract machine" (Deleuze and Guattari, 1987, p.147) of desire and choice. It is also an actualisation of many diagrammatic concepts that Ascott elucidates in his Artist Statement for the show "Diagram-Boxes and Analogue Structures" at the Molton Gallery, presented in an earlier section of this thesis.

The techno-poetic mechanism makes operative a specifically embodied mixed-semiotic (Deleuze and Guattari, 1987, p.147) "regime of signs." This "regime of signs" has been authored to examine and explore emergent meaning. Deleuze and Guattari here speak of the operative components of the "regime of signs:"

A regime of signs has more than just two components. It has in fact four of them, which form the object of Pragmatics. The first was the generative component, which shows how a form of expression located on the language stratum always appeals to several combined regimes, in other words, how every regime of signs or semiotic is concretely mixed. On the level of this one can abstract forms of content, most successfully if emphasis is placed on the mixture of regimes in the form of expression: one should not however conclude from this predominance of a regime constituting a general semiology and unifying forms. (Deleuze and Guattari, 1987, p.145)

The techno-poetic mechanism seeks to make operative the "generative component," enabling the *vuser* to select and actuate a subset from the overall mixed "regime of signs" that comprise the menu system. The *vuser composes* a spatial mixed-semiotic (Deleuze and Guattari, 1987, p.147) media-configuration. The media-elements that have been loaded into the menu system have been abstracted from a wide range of "regimes of signs," existing external to the system. The media-collection is itself presented as a grid/collage or "striated" space (Deleuze and Guattari, 1987, p.474) — defining a particular context. Here, Deleuze and Guattari continue defining the components of the "regime of signs:"

The second, transformational, component, shows one abstract regime can be translated, transformed into another and especially how it can be created from other regimes. This second component is obviously more profound, because all mixed regimes presuppose that transformations from one regime to another, past, present, or potential (as a function of the creation of new regimes). Once again, one abstracts, or can abstract content, since the analysis is limited to metamorphoses internal to the form of expression, even though the form of expression is not adequate to account for them. (Deleuze and Guattari, 1987, p.145)

The techno-poetic mechanism, through time-based manipulation and interaction with the collection of media-elements, exemplifies how "one abstract regime can be translated, transformed into another." It is this very act of transformation that enables generative meaning to arise. The techno-poetic mechanism enables one to access this process in an experiential manner, so that the *vuser* can actually observe how meaning arises as the new "regime of signs" is being generated. These signs inter-convey in a particular manner, potentially different for each configuration. The *vuser* becomes involved in emergent meaning production in that they drive the mechanism through their interaction and intellectual engagement. Deleuze and Guattari, continue to define the differing components of the "regime of signs:"

The third component is diagrammatic: it consists in taking regimes of signs or forms of expression and exacting from them particles — signs that are no longer formalized but instead constitute unformed traits capable of combining with one another. This is the height of abstraction, but also the moment at which abstraction becomes real; everything operates through abstract-real machines (which have names and dates). One can abstract forms of content, but one must simultaneously abstract forms of expression; for what is retained of each is only unformed traits. That is why an abstract machine that would operate purely on the level of language is an absurdity. (Deleuze and Guattari, 1987, pp.145-146)

One could say that the possibility for a media-element to be altered through context defines it as exhibiting "unformed traits." Is this not perhaps what enables language to function? A word always takes on meaning in a context of difference [différance]. (Derrida, 1976, p.23) This may include something which has previously been formed, suggesting that any media-element has unformed traits and has the potential for being altered through context. As earlier presented, Saussure pointed to this conundrum:

Time, which insures the continuity of language, wields another influence apparently contradictory to the first: the more or less rapid change of linguistic signs. In a certain sense, therefore, we can speak of both the immutability and the mutability of the sign.

In the last analysis, these two facts are interdependent: the sign is exposed to alteration because it perpetuates itself. What predominates in all change is the persistence of the old substance; disregard for the past is only relative. That is

why the principle of change is based on the principle of continuity. (Saussure, 1959, p.74)

This notion surrounding the complex functionality of the sign is more recently expressed through the act of quoting, appropriating, or "grafting" in the Derridian sense. The techno-poetic mechanism enables one to dynamically track this change. The techno-poetic mechanism is diagrammatic in nature. In every instance we observe relativities arising from the combination and recombination of configurations of "particles." These particles potentially contribute to an evocation through configuration. One must always remember to see these particles as part of a flow. I have earlier invoked the metaphor of the wave/particle paradox. The particles can environmentally appear as flow if they are viewed in a particular manner, from a particular conceptual perspective.

The techno-poetic mechanism is a "machinic assemblage" entirely comprised of constellations of "particles" on differing scales of combination. This assemblage also includes behaviours and media processes, bringing about "particle" realignment; moving through states of pure abstraction and coherence, where this "abstraction becomes real." I have earlier spoken of the punning nature of interface, enabling a connection to a underlying logical, computer-based process. The mechanism enables the dynamic tracking of the levels of abstraction which characterise differing states of these language-vehicles — the data projection of the output of the system — as part of its diagrammatic functioning. It is an "abstract machine" that functions through an elaborate, layered, conflation of mixed-semiotic meaning-vehicles. Deleuze and Guattari suggest that the diagrammatic component is more profound than the generative component:

It is clear that this diagrammatic component is in turn more profound than the transformational component: the creation-transformations of a regime of signs operate by the emergence of ever-new abstract machines. Finally, the last, properly machinic, component is meant to show how abstract machines are effectuated in concrete assemblages; it is these assemblages that give discreet form to traits of content - the two forms being in reciprocal presupposition, or having a necessary, unformed relation that once again prevents the form of expression from behaving as though it were self-sufficient (although it is independent or distinct in a strictly formal way.) (Deleuze and Guattari, 1987, pp.144–146)

It is the time-based, enfolded exploration of differing aspects of the techno-poetic mechanism that leads to the production of emergent meaning. One could say that the "assemblage" only becomes "concrete" in so much as it becomes evocative. It is this quixotic nature of computer-based mixed-semiotic realms that I wish to point at through

the techno-poetic mechanism. The nature of the system explores continuous transformation. We can only say that there is a probability of the production of emergent meaning arising through interaction with the device because each *vuser* has a different experience derived from their own particular exploration of the mechanism. We can not project an "objective" notion of emergent meaning arising from the generative environment, although one can abductively suggest numerous potentials for the arising of emergent meaning, through exploration and observation of the techno-poetic mechanism. Emergent meaning is, by its very nature, predicated on difference [différance]. (Derrida, 1976, p.23) This particular paradox is central to the research.

1 See Ashby, 1952, on self-organising systems.

5.1 Navigational Architectures

It is the fact that the computer can be both a conceptual code-driven machine and a physical one that enables the conflation of the abstract machinic assemblage with the concrete one, giving "discreet form to the traits of content." Again, we return to the positive perspective of the map being co-extensive with the territory, earlier seen as problematic to Baudrillard. This is true of the internal workings of the techno-poetic mechanism, although every textual "line of flight" (Deleuze and Guattari, 1987, p.21) emerging out of, or pertaining to, this experiential environment, shifts this equation. This dissertation becomes a pragmatic framing device, shifting the mapping from the computer-based experiential domain, across into an external textual realm. One must realise the subtle, mutable, enfolded nature of these differing but related territories. The field of meanings that are brought to light within this textual volume co-mingle with the experiential nature of the techno-poetic mechanism to differing degrees, depending on individual interaction. A singular field is emergent, consisting of the punny complexity of the mechanism as outlined within this document as it is registered within the cognitive space of the *vuser*, and co-mingled with perceptions derived through interaction with the system and/or through perceptions gleaned from viewing the enclosed documentation of the mechanism on CD-ROM.

Deleuze and Guattari discuss their notion of pragmatics in relation to the rhizome. "Thus pragmatics... can be represented by four circular components that bud and form rhizomes." (Deleuze and Guattari, 1987, pp.144–146) I have presented above a specific set of observations, exploring how my project relates to these "four circular components." I have sought to create an interactive, generative virtual environment that examines the above "pragmatic" relations by rendering them both operative and

experiential in nature. It is both the generative nature of the techno-poetic mechanism as well as the meta-operative nature of processes that are intrinsic to the use of the device, that enable emergent meaning to be examined and explored as content within the work of art — *The World Generator /The Engine of Desire*.

5.2 Dream Space

This device pushes the notion of the discourse mechanism to the edges of a dream-like space, where the concept of Freudian "condensation" (Freud, 1965, p.313) can be experienced as a vehicle of emergent meaning. As we come to understand the possibilities of computer-generated spaces, we must keep in mind the fact that the computer can digitally create anything that can be imagined and translated into the system. Turing entertained this possibility in 1946 (Turing 1986) in his writings about the potentials of computing devices, as did Lovelace and Babbage (Babbage, 1961, p.245) a century earlier. Spaces can be highly complex but in a different way to those of physical space. In the paper entitled "On Artificiality," Rafael Capurro, points toward some interesting historical relations. He articulates:

The metaphysics of artificiality considers all phenomena as real only as far as they are expressions of computational forms (algorithms or programs). The computational form has a higher ontological degree than so called reality since it can change it and reproduce it in another way. Reality is but an expression of computational virtuality. The artificial is the real. (Capurro, 1995, p.6)

The techno-poetic mechanism posits a particular, authored virtual "reality" enabling us to generate complex configurations of media-elements that we can then experience.

A contemporary discourse mechanism must be able to help us reflect upon both virtual and actual forms of complexity. The menu system in the work contains evocative media-elements — each presenting a field of possible conveyances. As these elements are entered into the world and abstracted, their specific meaning becomes less and less clear — it is here that I would like to revisit Gendlin's concept of felt meaning, suggesting that an abstract experience can be evocative in multiple ways:

What goes through is much more than what we "have" [explicitly]... any moment is a myriad richness, but rarely do we take the time to "have" it.... Going through a simple act involves an enormous number of familiarities,

learnings, senses for the situation, understandings of life and people, as well as many specifics of the given situation. (Gendlin, 1973b, p.370)

This richness can also include the evocative nature of dreamlike abstraction. The media-materials included in the techno-poetic mechanism begin as a set of "stable" selections, although the environment derived from those selections can become exceedingly abstract. This by no means derails meaning production, it just makes it more elusive to articulate textually.

5.3 Desire

We could ask: How does this work engage and/or frustrate desire? I have literally given the subtitle to the work: *The Engine of Desire*. The use of the word "Engine" is a pun related to computer terminology. We call a program of a specific function, an "engine." We can intimately link the metaphor of the "engine" — something which takes energy and turns it into a kind of force used to perform a specified function. As stated earlier, Ada Lovelace also saw its aesthetic potentials when she observed that "[The Analytical Engine, emphasis the author] might act upon other things beside *number* were objects found whose mutual fundamental relations could be expressed by those of the abstract science of operations and which should be also susceptible of adaptations to the action of the operating notation and mechanism of the engine." (Lovelace as found in Babbage, 1961, p.249) This is machine created to both stimulate and observe desire, functioning as a meta-desiring-machine, applying concepts discussed by Deleuze and Guattari. (Deleuze and Guattari, 1983, p.5)

The work presents a set of media-elements and a series of processes related to the use of those elements to explore emergent meaning. The first order of desire, in terms of this project, is the wish of the artist to create and explore the kind of system that can facilitate inter-authorship, evocative poetic communication and intellectual exchange. We now move to the next order of desire. The *vuser* of the techno-poetic mechanism is potentially stimulated both sensually and/or intellectually so that they desire engagement with the system. The media-collection and/or worlds generated by others, beckon this engagement. The machine is loaded with sensual and/or sexual images and these function both as texture maps and as digital pictures and/or movies. The eroticism of these images also potentially explores states of desire. The musical "objects" potentially promote a peaceful, contemplative psychological state. The user of the system may also desire the continued experience of this state. The work enables the construction of a world out of the selection of desired choices. This process of poetic construction both

fulfils desire through interaction with the system as well as extends or promotes that desire, thereby stimulating a desire in the user of the system to continue in this process.

5.4 Poetic Construction

The notion of *poetic construction* is a punning concept within the techno-poetic mechanism. It functions on both literal and metaphorical levels. The artist defines poetic elements of image, music/sound and text — constructing a specific set of recombinant poetic variables. The artist builds the poetic generating system, the loading of image, music/sound and text elements into the system, enabling a literal and metaphorical poetic construction. Derrida points at a new logic of the supplements of language:

There is not a single signified that escapes, even if recaptured, the play of signifying references that constitute language. The advent of writing is the advent of this play; today such a play is coming into its own, effacing the limit starting from which one had thought to regulate the circulation of signs, drawing along with it all the reassuring signifieds, reducing all the strongholds, all the out-of-bounds shelters that watched over the field of language. This, strictly speaking, amounts to destroying the concept of "sign" and its entire logic. Undoubtedly it is not by chance that this overwhelming supervenes at the moment when the extension of the concept of language effaces all its limits. We shall see that this overwhelming and this effacement have the same meaning, are one and the same phenomenon. It is as if the Western concept of language (in terms of what, beyond its plurivocity and beyond the strict and problematic opposition of speech (parole) and language [langue], attaches it in general to phonematic or glossematic production, to language, to voice, to hearing, to sound and breadth, to speech) were revealed today as the guise or disguise of a primary writing: more fundamental than that which, before this conversion, passed for the simple "supplement to the spoken word" (Rousseau). Either writing was never a simple "supplement," or it is urgently necessary to construct a new logic of the 'supplement.'" (Derrida, 1977, p.7)

The techno-poetic mechanism is a virtual environment that celebrates, and even seeks to move beyond, this "logic of the supplement." It presents an environment enabling the exploration of mixed-semiotic language-vehicles. The evocative nature of generated poetic constructions falls outside of the realm of the purely logocentric, although the logocentric is central to this external framing. Barthes describing a logocentric space, gives clues through a contemporary re-reading to approaching this new mixed-semiotic environment:

The fact is (or, it follows) that writing can no longer designate an operation of recording, notation, representation, "depiction" (as the Classics would say); rather, it designates exactly what linguists, referring to Oxford philosophy, call a performative, a rare verbal form (exclusively given in the first person and in the present tense) in which the enunciation has no other content (contains no other proposition) than the act by which it is uttered... on the contrary, the hand

(of the author), cut off from any voice, borne by a pure gesture of inscription (and not of expression), traces a field without origin - or which, at least, has no other origin than language itself, language which ceaselessly calls into question all origins. We know now that a text is not a line of words releasing a single 'theological' meaning (the "message" of the Author-God) but a multi-dimensional space in which a variety of writings, none of them original, blend and clash. The text is a tissue of quotations drawn from the innumerable centres of culture... (Barthes, 1977, pp.145-146)

The computer facilitates entirely new forms of "inscription." It enables us to explore an extended multi-dimensional space, a virtual space that includes a collection of varying media-elements. The "performative" nature of this environment enables the construction of emergent meaning, where poetic construction is *performed*. We can take the above statement and re-read it as a set of analogies — in which media-elements are substituted for the "uttered" to generate a new evocative environment. The question becomes — does this environment present a proto-writing? Is it a new linguistic form, in the broadest reading of linguistics, or is it something else? Of course to some extent, this depends on who is answering the question. I would suggest that calling this space an extension of writing will always lead us back to the logocentric. In terms of our understanding of elements and processes central to the techno-poetic mechanism, It does not make sense to try to understand the evocative nature of the differing media-elements based on a singular system. Music communicates differently from text, which communicates differently from image. Theorists have tried to literalise the relation between textual language and visual language; Metz, for example in *Film Language: a Semiotics of the Cinema* (Metz, 1974) explores this terrain. This literalisation has also taken place when looking at music as a language. Again, many have tried to examine music from the perspective of text. In the book *Image and Mind: Film, Philosophy and Cognitive Science*, Currie suggests the following: "One important aspect of the argument to follow is that language and meaning are by no means coextensive; there can be meaning which is not linguistic meaning." (Currie, 1995, p.120) On the other hand, we have a differing definition of the "linguistic domain" as presented by Maturana:

The linguistic domain as a domain of orienting behaviour requires at least two interacting organisms with comparable domains of interactions, so that a cooperative system of consensual interactions may be developed in which the emerging conduct of the two organisms is relevant for both... The central feature of human existence is its occurrence in a linguistic cognitive domain. The domain is constitutively social. (Maturana, 1970, p.41, xxiv)

Maturana goes on to say:

... I maintain that learned orienting interactions, coupled with some mode of behaviour that allowed for an independent recursive expansion of the domain of interactions of the organism, such as social life [Cf. Gardner and Gardner, 1969] and/or tool making and use, must have offered a selective basis for the

evolution of the orienting behaviour that in hominids led to our present-day language.

Where Currie, seeks to limit the concept of a linguistic domain, Maturana seems to extend it into the mixed-semiotic realm and even suggest its potential expansion based on new tools and new social relations. In this paradigm the computer is both a new tool and mechanism which contributes to new social forms. Here Winograd and Flores point to this difference:

Maturana refers to behaviour in a consensual domain as "linguistic behaviour." Indeed, human language is a clear example of a consensual domain and the properties of being arbitrary and contextual have at times been taken as its defining features. But Maturana extends the term "linguistic" to include any mutually generated domain of interactions. Language acts, like any other acts of an organism, can be described in the domain of structure and in the domain of cognition as well. But their existence as language is in the consensual domain generated by mutual interaction. A language exists among a community of individuals and is continually regenerated through their linguistic activity and the structural coupling generated by that activity. (Winograd and Flores, 1986, p.49)

Computer environments can potentially function as consensual domains, extending human agency through technological means and thus present an extended linguistic domain. I have chosen to describe the collection of media-elements included in the techno-poetic mechanism, language-vehicles — exploring the definition of language in its broadest sense. It is emergent meaning in any form, that I have explored through my generative virtual environment. Fields of meaning and meaning force are useful concepts to address the complexities of meaning as it arises within the techno-poetic mechanism. I return often within this paper to Peirce's definition of the sign:

A sign [or representation] stands *for* something *to* the idea which it produces, or modifies. Or, it is a vehicle conveying into the mind something from without. That for which it stands is called its object; that which it conveys, its meaning; and the idea to which it gives rise, its interpretant. (Peirce, 1931, p.171)

I have continued to point to the nature of conveyance inherent to the techno-poetic mechanism, seeing and hearing the collection of media-elements as sign variables. Meaning, in terms of this definition, is that which the configuration of sign variables "conveys." Emergent meaning arises from the differing contexts that these sign-configurations convey or evoke. This is by no means a simple meaning — it is a complex meaning that arises from the meaning-forces that a mixed set of milieus, functioning in dynamic relation, propagate over time.

One could also say that non-sign states are encountered within the techno-poetic mechanism. These arise during navigation, as well as through certain accumulated

behaviour processes, i.e., if a person chooses different media-elements and gives them the same behaviour, these elements become highly intermingled and lose their legibility. They become a kind of flow within the space. One could also say that this flow becomes evocative in a manner unlike that of other sign configurations. This configuration conveys an abstract force. Here Deleuze and Guattari describe a related notion of flow:

In the first place, for nonsignifying language anything will do: whether it be phonic, graphic, gestural, etc., no flow is privileged in this language which remains indifferent to its substance or its support, inasmuch as the latter is an amorphous continuum. The electric flow can be considered as the realization of such a flow that is indeterminate as such. But a substance is said to be formed when a flow enters into a relationship with another flow, such that the first defines a content and the second, an expression. The deterritorialized flows of content and expression are in a state of conjunction or reciprocal precondition that constitutes figures as the ultimate units of both content and expression. These figures do not derive from a signifier nor are they even signs as minimal elements of the signifier; they are non-signs, or rather nonsignifying signs, points — signs having several dimensions, flows — breaks or schizzes that form images through their coming together in a whole, but that do not maintain any identity when they pass from one whole to another. (Deleuze and Guattari, 1983, p.241)

A non-sign state might arise as a momentary passage within the generative space. These flows enter into relations with other flows and define an abstract pictorial content or "substance" within the environment and form an abstract expression. These abstract configurations can also be seen as having an evocative meaning; they become complex volumetric "figures." Regarding pictorial abstraction, Arnheim states "the perceived impact of forces makes for what we call expression." (Arnheim, 1957, p.365)

Another media-element that comes into play is music. Music can contribute to the evocative nature of context. Eco has spoken of the "receiver's response" as being active organising sense-data into meaning. (Eco, 1989, p.74) I have pointed at the problematics surrounding the observation of music functioning as a sign within the techno-poetic mechanism. Coker suggests "The sonic and rhythmic properties of music have effects on us; they produce dispositions to respond: they potentially are signs." (Coker, 1972, pp.2-3). We could also describe music as being linguistic in terms of Maturana's (Maturana, 1970, p.41) definition. Music can be external to the linguistic domain as Currie states "One important aspect of the argument to follow is that language and meaning are by no means coextensive; there can be meaning which is not linguistic meaning." (Currie, 1995, p.120). I can think music. It has a meaning for me. I can think words. They have meaning for me. I can think images. These also have a meaning for me. I think across all three milieus. Is not language, our attempt to manifest and transmit thought on the highest order, regardless of the semiotic medium?

I believe it is to our benefit to examine conveyances generated within computer-based environments, across semiotic melieus, as a new, expanded form of language use. As time passes we will become better equipped to understand and articulate the complexity of this form. We may now correctly say that we are dealing with a semiotic realm, outside of the realm of pure language in line with Deleuze and Guattari's ideas. Semiotics contains text, both inscribed and spoken, as a subset of it's definition. As we examine the complexities of textual communication and language learning, I believe it will become difficult not to acknowledge an expanded notion of context, due to computer-based spaces, in which media-elements function as active agents in language transmission. The term language-vehicle has been employed throughout this dissertation to refer to the set of media-elements that becomes activated through interaction with the techno-poetic mechanism.

I have presented Kristeva's concepts of intertextuality: "The term *inter-textuality* denotes the transposition of one (or several) sign system(s) into another" (Kristeva, 1984, p.60) Kristeva suggests that "polysemy can also be seen as the result of a semiotic polyvalence — an adherence to different sign systems." (Kristeva, 1984, p.60) It is this kind of mixed-semiotic virtual landscape that characterises the potential generative capacity of the techno-poetic mechanism. We could say where there is polysemy there is polyvalent meaning. I have described this space as cyber-polysemic. As mixed-semiotic fields of meaning are commingled, new meanings potentially arise in terms of the construction of new contexts. The techno-poetic mechanism functions as a context generator.

Interaction with the system enables the *vuser* to construct an environment and then navigate in a synthetic world. Interaction with the elaborate system of constituent components takes place through the volition of the mind and body. The environment presents a complex intermingling of actual and virtual space. Content becomes available because of the sophistication of the system, although the *vuser* encounters only the metaphorical *tip of the iceberg*. Only the outermost layer of visual, sonic and tactile symbolic logic becomes available; the remaining parts of the system, the functionality of the computer code, become transparent and are hidden from view. This enables the feeling, for the *vuser*, of a direct interaction with the logic of the environment itself. It is as if the computer did not exist at all — only the responsive functionality of this conceptual/physical space.

5.5 Resonance

As an artist, I am interested in works which are metaphorically resonant. One may ask, how is resonance constructed within the system? For me, resonance is constructed both literally and metaphorically through the choices and development of a loaded aesthetic collection of media-elements. This makes a punning resonance which fuses the literary, the sonic/musical and the imagistic. This resonance is a by-product of the economy of compression and exchange; of meta-patterning. It is the frictionless action of the techno-poetic mechanism, displaying a "playful physics" (Duchamp, 1989, p.49) as explored through these media-elements that trigger a sense of the uncanny during interaction.

There are different strategies that an artist can take to enable the creation of resonance in a work of art. One strategy deals with the employment of a network of media-variables of specific puns or written/spoken language which is specifically-ambiguous, carrying the potential for alternate or multiple readings. Different contexts bring to the fore alternate spokes of understanding. As earlier stated, puns enable a form of condensed content or a specific ambiguity.

A resonant construction is enabled when media-elements with multiple meanings form a network of polyvalent associations. The artistic media-collection that is employed in my work can greatly contribute to the potential of resonances arising during and across the process of the work's becoming. Meaning resonates when the *vuser* assumes an engagement with a "set" of multiple references that qualify and act upon each other in terms of entire assemblages of association. The oscillation between different associations forms a network of emergent content triggered by individual elements functioning in relation to one another. Central to the research is the notion that a pre-generated collection of media-elements can be entered onto the plateau and can be made functional in terms of meaning force and/or operative within a combinatorial media-environment. These media-elements do not only present textual puns or ambiguities. I am speaking about a media-collection authored for its particular multi-valent properties. In the literary and artistic history presented in this document, I have stated that a series of artists historically have explored specific-ambiguity within their poetics. This can mean choosing, shooting or generating an image which is "slippery" in nature; difficult to describe, as well as suggestive of a "field" of possible associations. This image might also be the literalising of a textual pun. Specific-ambiguity can be brought about by a displacement/re-placement function which is internal to the constructed context. If we think of each word, image or piece of music as being at the centre of a wheel of potential meaning, where a set of spokes represent each different meaning, a particular context may only engage one particular spoke.

Rosenboom is also interested in transdisciplinary study as well as what I also take to be a "punning" notion of resonance. In terms of my project one can read this punning on textual, imagistic and sonic levels. Rosenboom states:

The concept of resonance is crucial to this overall picture. It is the tendency for certain recurrent behaviours to grow, as initially infinitesimal vibrations or patterns become self-reinforced, due to the way in which they fit within the spatiotemporal geometry of a bounded system, often aided by some feedback. Such behaviours also decay after the excitation energy is removed. Alternately, if the system is wildly unstable, it may break apart. Resonance also involves the idea of coupling among systems in which the excitation of one system, in a particular form known as an eigenstate, is transferred to another. In this way, information is transmitted and further, may be propagated through a medium (population of systems), producing a kind of spatial diffusion of the eigenform. This geometrical notion of communication may, in fact, be more appropriate than our usual one involving the juxtaposition of linear sequences. (Rosenboom, 1993, pp.6-7)

The techno-poetic mechanism can potentially involve "the idea of coupling among systems in which the excitation of one system" or milieu... "is transferred to another." This concept, in both literal and metaphorical form, is central to bringing about a resonance between elements of image, music/sound and text. In fact, it is the nature of this resonance that helps to reinforce the production of emergent meaning. Focusing primarily on musical systems, Rosenboom suggests that the definition of resonance can be applied to larger mixed-semiotic realms, i.e., "electronic networks, societies and ecosystems." (Rosenboom, 1993, p.10)

5.6 The Complexity of an Environment of Enfolded Media-Elements and Processes

Configurations of media-elements do not produce simple, easy to read, elemental meanings. It does not make sense to address the techno-poetic mechanism in terms of fixed meanings. Instead, this work should be examined in the light of a shifting, fluid, emergent content, contingent on the nature of the processes, media-elements and behaviours that have been authored into the system.

Association and play by the *vuser* are central to the process of exploring the potentials of the techno-poetic mechanism. As media-elements are combined, both in real time and through temporal arrangement, a depth of association is generated. Content becomes, in this mutable context, temporary and mobile, as well as accumulative and polyvalent in

terms of association. The environment is engaging on multiple levels and is potentially richly contemplative.

Media-elements incorporated in the techno-poetic mechanism, move through a potential set of states. An element may elicit a particular reading in relation to a complex environmental set of factors and may exhibit further readings in alternate, emergent spatiotemporal contexts. We must see the techno-poetic mechanism as functioning within a continuous state of becoming. The word "set," examined in terms of its linguistic multiplicity, carries a series of meanings: "Set" as multiple or pair (elements are only temporarily examined in isolation), "Set" as illusionistic architecture (referring to the media space in which these elements become activated)¹, "Set" as contemporary device (as we now witness the TV Set merge with computers and international network technology), "Set" as in mathematics (suggesting the notion of probabilities, chance, configurations, and so on and so forth). The "set" is just one of a series of puncepts. (Ulmer, 1988, p.164) The word "set" was also used by Ascott in his Artist Statement for the show "Diagram -Boxes and Analogue Structures," I think one could say that Ascott was also interested in the concept of the Puncept, before it was officially articulated by Ulmer, where Ascott states, "DIAGRAM-BOX AS VARIETY ACT, The (reference) frame provides a SET of panels (states)." (Ascott 1963) — Variety Act and Set can both be read in terms of multiple meanings.

Meaning-force becomes a central concept as we begin to examine communication as a "circulation of energy states," as presented in the definition of the rhizome by Deleuze and Guattari (Deleuze and Guattari, 1987, p.21). We could say that each element is a kind of loaded field of conceptual force which acts in relation to a series of other forces in proximity. We read the potential meaning of these elements in relation to a shifting constructed context, over time. Because of the complexity of this context, the *vuser* does not perceive a simple meaning, but a potential assemblage of thoughts and associations. A "constructed context:" arises:

- as a by-product of interactive poetic-construction processes;
- through navigation and temporary perspective;
- through time-based viewing;
- through subsequent reflection related to a remembered context;
- through external conceptual framing.

In the techno-poetic mechanism, the context is brought to light through some form of inter-authorship and/or interaction on the part of the *vuser*.

As language is explored and extended within new technologically created contexts and that language becomes part of an operative computer-based environment, new forms of

language use are potentially brought to life. The techno-poetic mechanism functions in part by reflecting the ephemeral nature of meaning production within this contemporary information environment, as a form of experiential discourse mechanism. By abstracting relations from the world at large and poetically reflecting these relations within an experiential system, we can begin to directly sense the fleeting qualities inherent to the contemporary construction of computer-based context. A recombinant system enables the *vuser* to observe the nature of the decontextualisation of chosen material and subsequent recontextualisation within a constructed technological spatial environment. While being highly purposeful in its design, the system enables the *vuser* to interact "purposelessly," to drift and navigate freely through specific and subtle poetic domains. In *Silence* John Cage articulates the significance of "purposeful purposlessness," a practice well-established in other art forms... "The highest purpose is to have no purpose at all. This puts one in accord with nature in her manner of operation." (Cage, 1961) The techno-poetic mechanism enables a playful examination of emergent meaning.

The work "*The World Generator/The Engine of Desire*" can be viewed as a meta-"machinic assemblage," delivered through a continuum of configurations (or figures) of light and sound, functioning as a virtual environment. Here, Deleuze and Guattari describe their book, *A Thousand Plateaus*, as an assemblage:

In a book, as in all things, there are lines of articulation or segmentarity, strata and territories; but also lines of flight, movements of deterritorialization and destratification. Comparative rates of flow on these lines produce phenomena of relative slowness and viscosity, or, on the contrary, of acceleration and rupture. All this, lines and measurable speeds, constitutes an assemblage. (Deleuze and Guattari, 1987, p.4)

In my virtual space, this "deterritorialization" is intentionally intensified and is facilitated through a completely new form of authorship and inter-authorship. The techno-poetic mechanism functions as operative meta-media-assemblage, enabling high-level interaction with chosen media-elements. A "circulation of states" (Deleuze and Guattari, 1987, p.21) presents the common strand that unites all of these processes within one rhizome. One could extend this and say a circulation of energy states functions as the unifying element.

The notion of "not maintaining an identity" can be seen in the techno-poetic mechanism, as representing both a "shifting" identity as well as an accumulating one — pointing toward a multiplicity of identities becoming one complex identity over time — a becoming-one. Deleuze and Guattari are quite clear about their break with the Saussurian tradition in terms of identity:

We believe that, from all points of view and despite certain appearances, Louis Hjelmslev's linguistics stand in profound opposition to the Saussurian and post-Saussurian undertaking. Because it abandons all privileged reference. Because it describes a pure field of algebraic immanence that no longer allows any surveillance on the part of the transcendent instance, even one that has withdrawn. Because within this field it sets in motion the flows of form and substance, content and expression. Because it substitutes the relationship of the reciprocal precondition between expression and content for the relationship of subordination between signifier and signified. Because there no longer occurs a double articulation between two hierarchized levels of language, but between two convertible deterritorialized planes, constituted by the relation between the form of content and the form of expression. (Deleuze and Guattari, 1983, p.242)

The World Generator/The Engine of Desire extends Hjelmslev's linguistic approach into a new realm of media-authorship that explores this concept of "two convertible deterritorialized planes, constituted by the relation between the form of content and the form of expression." It makes meta-operative the exploration of content and expression. It enfolds many perspectives within the territories it displays.

Hjelmslev proposed a near impossible task:

In a new sense, then, it seems fruitful and necessary to establish a common point of view for a large number of disciplines, from the study of literature, art and music and general history, all the way to logistics and mathematics, so that from this common point of view these sciences are concentrated around a linguistically defined set of problems. Each will be able to contribute in its own way to the general science of semiotics by investigating to what extent and in what manner its objects may be submitted to an analysis that is in agreement with the requirements of linguistic theory. Thus new light might perhaps be cast on these disciplines and they might be led to a critical self-examination. In this way, through a mutually fructifying collaboration, it should be possible to produce a general encyclopaedia of sign structures. (Hjelmslev, 1963, pp.108-109)

The immensity of the problem surrounding the complexity of this undertaking, the construction of a mixed-semiotic "general encyclopaedia of sign structures" is daunting. The techno-poetic mechanism might be seen as a particular interactive diagram illuminating a specific set of cases related to an emergent field: "recombinant poetics," as it is applied in the exploration and examination of emergent meaning. This diagram, my techno-poetic mechanism, would populate but one small vicinity in one virtual volume in an infinite set of volumes, compiled over time. This begs the question: what new integrated technology might house this undertaking? Which new integrated technology might house a "general encyclopaedia of sign structures?" What new forms of recombinant poetics might be drawn from this media-collection?

The nature of emergence suggests that this collection must be ever expanding. This "general encyclopaedia" somehow must also deal with the following concept, the notion of "multiple intelligences," as discussed by Roosenboom. He suggests "that human beings possess very distinct and coexistent kinds of intelligence — such as verbal, spatial, mathematical, musical and emotional intelligence — and further, that no single set of descriptions or measurement assumptions applies with equal validity to all." (Rosenboom, 1993, p.10) This begins to describe the nature of the problems surrounding the construction of a techno-poetic mechanism — a device which seeks to intersect each of these domains.

I have addressed questions surrounding emergent meaning, by enfolding a series of transdisciplinary perspectives. I have authored a specific virtual environment — the techno-poetic mechanism. It is the layered authoring of a mixed-semiotic realm that seeks to point at its own complexity, as an abductive instance generator.

If it is the goal of language to transmit meaning in all of its complexities, then it is also a goal to come to understand and approach these complexities. Computer-based generative virtual environments are highly complex in how they manifest conveyance. All of the media-elements that I have included in the techno-poetic mechanism function as language-vehicles, although what they convey, especially in terms of their final contextual configuration, is in every sense of the word, emergent. This notion of emergence through recombination is the operative feature of all language systems. I have emphasised the need to develop a theory of environmental meaning as it relates to virtual environments. I have sought to shed light on some of the questions that surround this undertaking. Hjelmslev here provides a expansive perspective on linguistic theory:

Linguistic theory is led by an inner necessity to recognize not merely the linguistic system, in its schema and in its usage, in its totality and in its individuality, but also man and human society behind language and all man's sphere of knowledge through language. At that point linguistic theory has reached its prescribed goal: *humanitas et universitas*. (Hjelmslev, 1963, p.127)

Many contemporary aspects of language usage have been taken into account in the authorship of the techno-poetic mechanism, drawing from the knowledge of diverse disciplines. The depth and complexity of the nature of media-conveyance within a specific generative virtual environment, has been observed, drawing from the larger sphere of the arts as it becomes enfolded with other transdisciplinary practices. The techno-poetic mechanism enables us to enter into a highly complex experiential realm. Within this space, I articulate questions surrounding emergent meaning production in a

direct manner. Above all else, *The World Generator/The Engine of Desire* is a work of art that enables the exploration and examination of emergent meaning.

1 See also *Computers As Theatre* (Laurell, 1991)

6.0 Conclusion

I have sought in this dissertation to answer the following question: Can an interactive art work be constructed so that emergent meaning can be examined and explored within a specific generative virtual environment by a variety of users? A broad survey of primary and secondary literature has been undertaken to inform this project. I have also drawn on my experience as a professional artist using electronic information delivery systems to develop an elaborate techno-poetic mechanism. The authorship of this art work functionally enfoldes many perspectives related to meaning production. In particular, a series of questions concerning relationships between the artist, the art work and the *vuser* have been articulated. A specific generative virtual environment, enabling both poetic construction and virtual navigation within this mutable computer-based space, has been authored. The process of creating this techno-poetic mechanism was extremely complex. The diversity of foci that have been practically enfolded within the operative nature of the mechanism, compounded this complexity. The work progressed through many iterations. Elaborate planning, construction, as well as testing and honing, eventuated in the operative device. The device has proven functional.

The work has been shown in Japan, Germany, England, France, Hungary and Belgium. The poetic text included in the work has been translated into Japanese, German and Hungarian. A fully functional Japanese translation version of the mechanism have been authored. It has been exciting to witness how such a translation version impacts on meaning production. The differences exhibited in languages from country to country also presented a set of problems.

One of the most interesting outcomes of the research has been the facilitation of networked examples of the mechanism, enabling cross-cultural meaning exploration. Participants from two countries enter into linked copies of this generative virtual environment. They see each other over video-phones. They also see the relative virtual position of the other participant(s), in the form of a video image, in the electronic space before them. They can speak to their collaborator. The participants can act together to make changes in the environment and explore the meaning that arises out of this interaction. Historically, this presents an exciting expansion of the concept of the artistic venue. The collaborative nature of such an environment also has many implications related to non-art applications wherein symbolic activities in virtual space can have functional impact on lived experience. I will elaborate on this in the chapter "Future Research."

The mutable nature of the computer-based space that characterises virtual environments raises many questions concerning meaning production. In particular I have sought to articulate the ways in which the techno-poetic mechanism affects our understanding of theories of meaning. A series of transdisciplinary theoretical positions have been observed as they relate to emergent meaning production. The literature addressing meaning production is extremely complex and many authors present contradictory or alternate theories. Hence, in each case I have sought to find the most relevant theory and to show its relation to the project. Obviously virtual space presents many problems concerning meaning production, by its quixotic nature and inherent complexity. I have tried to extend the realm of understanding through examination of theoretical positions relating to the subject.

A range of approaches to the production of emergent meaning have been articulated. Each of these approaches becomes operational within the techno-poetic mechanism. The dynamic juxtaposition and interpenetration of media-elements, facilitated through interaction with the computer-based system, enables experiential examination of emergent meaning as it arises within varying contexts. The diagrammatic nature of the mechanism has been textually described and the meta-operative functionality of the device has been elucidated.

A specific techno-poetic mechanism has been authored that can be seen to be relevant to both poetics and media-discourse. The philosophical ramifications of the device have been outlined and a set of focus areas relevant to the project have emerged and have been articulated during the research including an articulation of re-embodied intelligence and nonsense logic. The punning nature of symbolic logic has also been discussed. I have also defined a new form of music composition that I have termed recombinant music.

The problem of seeing this device alternately as a new linguistic form of proto-writing and/or an example of mixed-semiotic authorship and inter-authorship can not be resolved at this time. I see the importance of developing a theory of language-vehicle use [or language use] in virtual environments as an important future venture. Future researchers will need to take into account the complex nature of the mixed-semiotic conveyances that characterise these environments; they would also need to approach this problem with the knowledge that generative virtual environments may be non-closed and highly mutable.

The palpable nature of operating on and with media-elements has many interesting ramifications. The diagrammatic nature of the environment can be quantified. Data can

be collected about decisions in virtual environments with ease, where patterns of usage may be charted, stored and compared. Alternatively, the open nature of the computer as a vehicle of authorship makes the study of commonality across differing virtual environments problematic.

The authored physics of such environments presents an exciting poetic potential. This is especially true of what might be called media-behaviours or reactive-media. One can currently witness the shift of the World Wide Web from hyper-media to the realm of networked virtual space. My research into the construction of the techno-poetic mechanism may contribute to an understanding of these new electronic spaces.

I have sought to answer the following question: How might the construction of this techno-poetic mechanism inform a new field of art practice? The outcome of this research suggests a radical transformation in meaning production as dynamically encountered through interactivity within generative works of art. I have presented my concept of recombinant poetics. Recombinant poetic works share the following attributes:

- emergent properties are explored by an interacting participant;
- interactive engagement is empowered at a high level;
- the artist defines the approach to the art content;
- the artist involves media-construction as an active process in the work, calling forth the exploration of media-elements;
- the works are functional examples of generative virtual environments.

Emergent experience and concomitant emergent meaning is an evocative product of each of these recombinant poetic works that I have presented. A diverse set of researchers and artists, drawing from a particular cultural/technological milieu, can gravitate towards a range of relevant issues, each individual presenting her or his approach regarding aesthetics, interface design and fields of content. In this light I would suggest that recombinant poetics can be seen as its own field or discipline, in which practitioners contribute, each making a personal, historic example.

The textual discourse provided in this document articulates the problems surrounding this research and has sought to frame the functionality of a specific generative virtual environment. This techno-poetic mechanism has proven to enable the examination and exploration of emergent meaning. Thus, I have articulated questions surrounding emergent meaning production in both theory and practice.

I have also enclosed an elaborate CD-ROM documenting the functionality of my generative virtual environment.

7.0 Future Research

The techno-poetic mechanism, created as a work of art, is a tool for generating and examining virtual worlds. The functionality of the device presents huge potentials in terms of non-art realms. This mechanism could be used for different kinds of design purposes, i.e., architectural, landscape, or interior design; for scientific purposes, i.e., storage and retrieval applications related to digital video, digital still imagery, digital audio, 2D and 3D text and 3D objects; as well the exploration of object-based programming, where a *vuser* could generate configurations of object-based computer code, creating new forms of computer-based functionality in a user-friendly, intuitive environment. The interface metaphor is open in terms of its functionality and can be applied to any need that requires digital construction, display, storage, navigation and access within a virtual environment.

Given the appropriate code, the mechanism could also function as a generator of intelligent agents. Perhaps the most exciting prospect of the device is its potential as an environment to generate VRML worlds on the World Wide Web. Were we now use primarily 2D metaphors for interfaces, one can imagine the use of 3D interfaces and navigation metaphors. The techno-poetic mechanism could be used to build a variety of personalised virtual worlds, based on the collection of media-elements and processes, authored and entered into these alternate environment generators. Thus the generative properties that have enabled the exploration of emergent meaning, have the potential to be extended beyond artistic application, to facilitate the construction and navigation of diverse, complex, emergent virtual media-environments. We could also imagine a networked approach, where numerous environment generators were linked together across the World Wide Web, enabling the construction of hybrid worlds, combining the media-elements of numerous participants within one highly complex visual and sonic MOO or MUD. In terms of poetic form, other artists might use the system, developing their own particular set of media-elements and processes to be loaded into the system. Thus, an entirely new form of poetic media-authoring environment is facilitated. The device might also potentially function as a virtual memory theatre, extending ideas that have been described by Yates in *The Art of Memory*. (Yates, 1966). The emergent potentials of the device for both creative and functional application, are immense.

8.0 Bibliography

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9.0 Appendix

Figure 1. Relevant Work History [Seaman] —
Recombinant Poetic Precursors In My Work

P.L.A.N.E.S. —

Punctuation, Letters and Numbers Entering Superimpositions, 1981
Sound Performance

.apt.alt., 1981

Sound Performance

One Pulls Pivots At The Tip Of The Tongue 1982

Original Text and Cut-Up Text

Elastic Movies - Dance Haiku , MIT CAVS/Media Lab - 1983/1984

Interactive Videodisc

MS Vis S Thesis - *An Examination of a Network Of Poetics From The Realm Of
Language / Image / Sound Relations*, MIT, Cambridge, Massachusetts, 1985

Telling Motions, 1986

Linear Video (Template for Interactive Videodisc)

The Watch Detail, 1990

Interactive Videodisc Installation

The Exquisite Mechanism of Shivers, 1991

Interactive Videodisc Installation

The Exquisite Mechanism of Shivers - Japanese / English - English / Japanese

Translation Version 1994 — Interactive Videodisc Installation

Ex.Mech, 1994 on the CD-ROM - ARTINTACT

Interactive CD-ROM

Passage Sets / One Pulls Pivots At The Tip Of The Tongue, 1995

Interactive Videodisc Installation

Figure 2.

Exhibitions of the Work: *The World Generator/The Engine of Desire*
with Gideon May — Programmer

1999

- "Perspectives," Virtual Reality, Budapest Hungary

1998

- "Portable Sacred Grounds," Networked Virtual Reality connecting ZKM, Karlsruhe, Germany and Intercommunication Center, Tokyo, Japan
- C3, Virtual Reality, Budapest Hungary
- Industrial Forum Design Award for *The World Generator/The Engine of Desire* ,
Hannover, Germany

1997

- Networked Virtual Reality connecting ZKM, Karlsruhe, Germany and Les
Frenois, France
- Networked Virtual Reality connecting ZKM, Karlsruhe, Germany and London,
England
- "IT (Information Technology) Conference Exhibition," Networked Virtual Reality
connecting ZKM, Karlsruhe, Germany and Brussels, Belgium
- "Interact," Wilhelm Lembruck Museum Duisburg, Germany

1996

- Dutch Electronic Art Festival Rotterdam, The Netherlands

Figure 3

The World Generator/The Engine of Desire Text Included In Menu System

quantum behaviours - the paradox engine
floating signifiers of the doubt progressions (arithmetic)
turn fold library of constellation puns
n spoke shunt jumpers
empty vessel theatre drives
shared oscillation reference fields
generator meta-constructs
random fall mechanisms
auto-positioning game board moves
meta-empty projection fields (in waiting)
snare set models
recombinant code construction presence
inward and outward shunt vessels
objectspun
large and small infinities of code vicinities
condensation dispersions of infinite re-definition
the looping turn bridge
pool loops / loop pools
room of memory collection debris
the tearing of vessels
the tearing of vessels
endgame of architectural endgames
blue museum of theatre engines
null expression receptors
the physics of the void expression
word chain reaction trees
the positioning and re-positioning of object spokes
silent hands repositioning
the lie of luminosity | lay of the landing
reverse engineering paradox
fabrication illuminates the museum of emptiness
fabrications of emptiness in the museum of illumination
low light eye fabrication
structure signatures of sublime erosion
conducting bone transmission pulse bridges
drum language vessel engines
omnilocal eyes in the light of fabrication
sexual signal site abstracters and extenders
elegant locution | mouth of chance
desire exchange foci
arteries of arithmetics
solutions of doubt mixtures
energy of loss
recovery frames
spinning steadily in reverse equal to the speed of rotation
standing still | changing context
equations of symbolic orders and disorders
vessels of the dance
reorientation rebus

sound distances
sounding out situations
motioning clear
halation of magnetics
motionless flight of the conveyor
window trees
vast territories of the entropyless domain
optical futures
shifter eye constants
numb breather songs
throat of blood rust
symbolic duration of hair
phantom gestures of the body
amplification hands
slow flow / gravity of glass thoughts
blueprint of sand
silence as it circulates and slides
the skin of experience
functions of the desire bearings
physicality of the emotional hand
release of self-guided desire mechanisms
co-ordinates of resonant desire
vessels of the collapsed field
container release triggers
paradox engine maps
drifting non-arrival
drive collision mesh paths
floating destinations
remotional aggregates
felt expressions of the folding engine
a thought map which builds an expression
components of thought (re-embodied)
collapsing through generative mind sites
alife compartments
transfer skin | transposition
chess snare | forking map
self organising desire mechanisms
geometric falls
gravity of luminous hands
resonance scatter drivers
phantom limbics
architecture of thought weaving
violent ballet | quiescent repose
slowly sinking light ship
the circulatory lighthouse of blue sound
empty touch / blue void
ballet ship
born of the wreckage debris (re configured)
light flows across all void distance
looping fields of silence
simple gestures delineate the site of desire
eventual smooth equilibrium
a simultaneity of infinities
storage of desire collapse realms
dispersion of desire vehicles
entering - resonance architectures
self supporting architecture | definition room
self suspended

removal of time place
times items bridging
edge of the world parameters | landscape loop
behavioural voice
orders of magnitude | orders of behaviour
aleotric driver re-alignment rebus
skin of reason (touched)
museum of the void
circulatory systems
arbiters of displacement
navigational memory
governor of rotation engines desire bearings
conveyor engines
tag shifters | tethered and floating
numb flows
indexical shifters
mixed metaphor [mechanics]
an answer that asks questions
poly-syntactic rotation {objects}
word falls
Body theatre thought vicinities
entering - entering
navigating observation
observation containers
gestures of inclination
shadow triggers
behavioural conveyors
the null set relationals
screen blank vessels
a propensity toward inversion
the back of signs [storage sites]
Wittgenstein's handles
reframing the gaming field
pulse permutation shimmers
sound substitution sets
properties of inverse polemics
action at a distance [bridges]
non-causal chain reactions
recombinant architectures of information
molecules of thought ambivalence
soft sliding rules
transmutation trigger metaphors
once again removed
one word for another [place]
event window [s]
text behaviours
palpable exchange rotations
thought vessels
algorithmic holds
self aware entities
rotating schedules
conveyor vessels
felt behaviours triggered by non-entities
tactile turnstile conductors
de-contextual contact facilitator fields
false emulates in the netting
room pools
written in rotating drums

encoded function rooms
 encrypted rule sets
 levels of longing [elucidated]
 elliptical or circulatory cross-pollination metaphors
 compound collection machines
 recollections recombined [false history generator]
 code book looks ups
 invention generator pulse rhythms
 cadence of the trigger variables
 apparatus for reflection dispersion
 amorous theatre screen mesh
 sexual web of perception alloys
 carnal | canal
 amatory ambience of tender decline
 sensorial net drive assembly
 fundamental conveyor shaft
 morose transference mechanism
 shaft passage conveyor
 drift course resolve
 apparatus shelves
 spindle axis vehicles
 blue voiceprint snare
 angles of envelopment
 uncertainty angles | allusive sextant
 shaft beam labyrinth
 rotary emission beacon merge
 loaded dice object spins
 radial illuminations
 gyro-linguistic stabiliser
 rotation schedules of revolving desire bearings
 dispersion potentials
 desire bearings
 conductor desire shells
 hands of light gestures
 alchemical symbols | alchimeral slink
 x (.....) y
 false emulates of the rotation stands
 swivel location fulcrum
 circulatory map disruptions
 face of light spool
 photosynthetic metaphoric fields
 doubled over | layered spindle turns
 crossed object turnstiles
 selection spindle weave
 bridge fasteners and repulsion keys
 electricconnector contact mesh
 folded doubles
 oblique enablers
 chemical endgame memory flights
 biogenetic code plays
 bio-endgame storage
 digital spill containment vessels
 KING and QUEEN electro-transfer ducts
 cohesion resonators
 rarefied fields
 alchemical remembrance
 trace balance elements
 association valence

paradox shells
meta-lily | periodic vessels
pataphysical drift configurations
trollers of the light realm
thought with spin
sleek oblique luminous links
meta-engine nets
distributor of thought engine filters
table of non-predictable alignments
angle of incidence or inception carriers
dis-logistic sparks of dispersion semantics
angles of percussion and recoil
inexhaustible diffusions
thrown meaning | sliding means
scattered association
oscillation valence
spark of the skew gap
meta-sliding function | poetic engines
function engines of alternating strings
engines of sliding field oscillation
domain of rotation
blind skill within the shells of silence
meta-operator voices
the desire engine and the agents of oscillation
the sensual transference mechanism
the realm of the desire engine
circumnavigation rings
cycles of relatives
eye of the needle | eye of the loop
tower of babel | eye of the storm
the light of distance
quantum jumps without falls
recognitive resonance
a suspended net sentence
suspension suspended
engendered strings of sonic fields
in the light of absence
puny hardware
mercurial tropes
parallel stream drivers
exploded objects of quiescence
transitional poetics of disembodiment
surrogate sense fields
conundrum domains | bridged and fused
chess theatre drum snare pair
a trap of folded fields
alchemical relatives
objects which turn in on themselves
inversion objects
poem of the exploded word
gathered misnomers
revolving glass door
arboretum of reciprocal inversions
acrostatic architectures of collapsed time
bodythought compressions
site which fabricates sites
personal cipher machines
encryption system strings

trap door code names
anagrammatic exchange objects
camouflaged key word states
situationals
poly-syntactic emblems
coded compartments
trade craft decoy ploys
books can become like shoes... [slogans]
ligature of the light passage bodies
hands of information
floating function rooms
indeterminate arcs of reaction
location sensitive self regulating rules
the desire object reflection mesh
a room which gets ahead of itself
[fabrication] housings nestings vessels and levels
turn puns which loop around an axis / access
sung round of rotations
a pun spun and retouched
frequencies of event windows
nested generator rebus bridges
dis-rebus
world within a word
a machine to generate or navigate puns
speed of reflex thought implosion
delta-set shunts
pataphysics of introspection
skin of light
tongue of the labyrinth
elevator sentence
radial means
cross a book with a landscape
a periodically relative battery of scores in scale / one to one
optimal use of uncertain information
the profession of release
displacements | a machine of exchange